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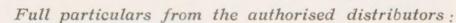
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The Motor-Owner, November, 1921

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Stand No. 5

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- Sept. 10. First and Second places in Italian Motorcycle Grand Prix.
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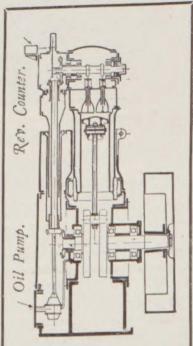


Diagram of variable compression cylinder of motor engine employed for scientific tests of "Shell" Spirit.

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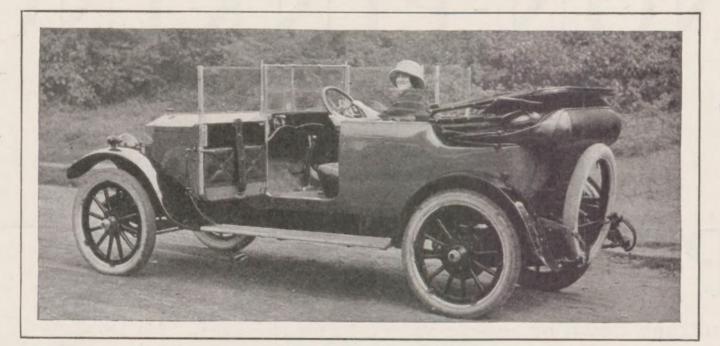
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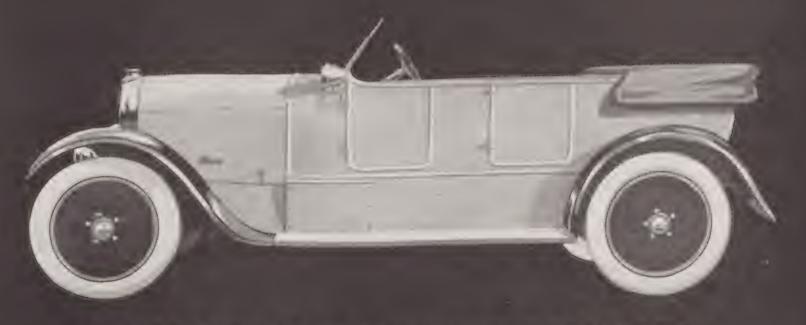
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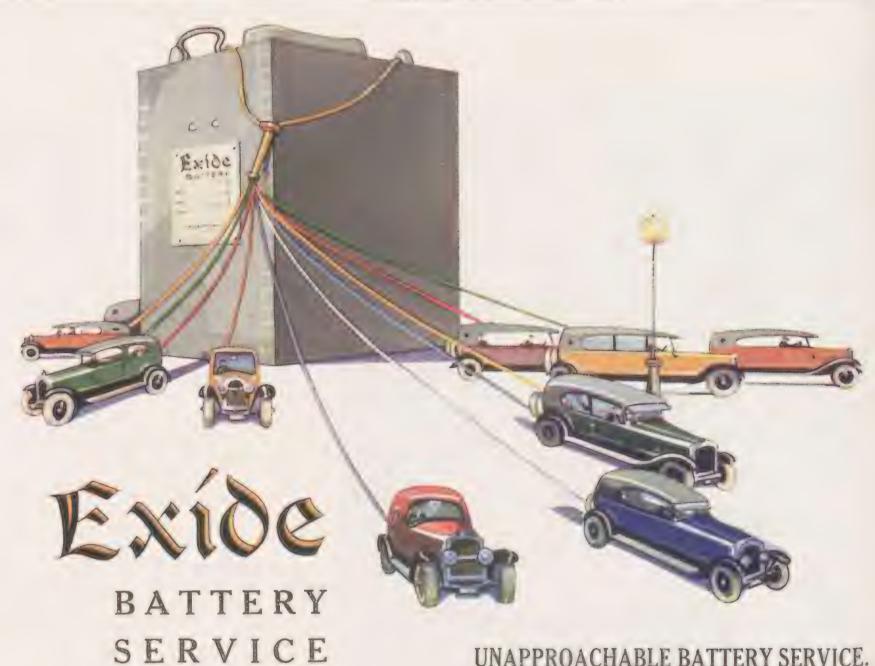
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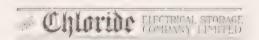
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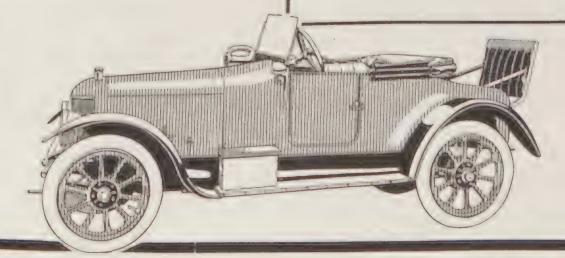
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The Motor-Owner, November, 1921



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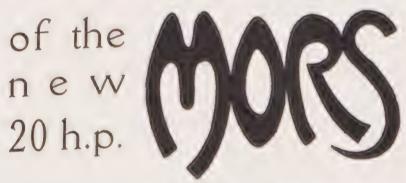
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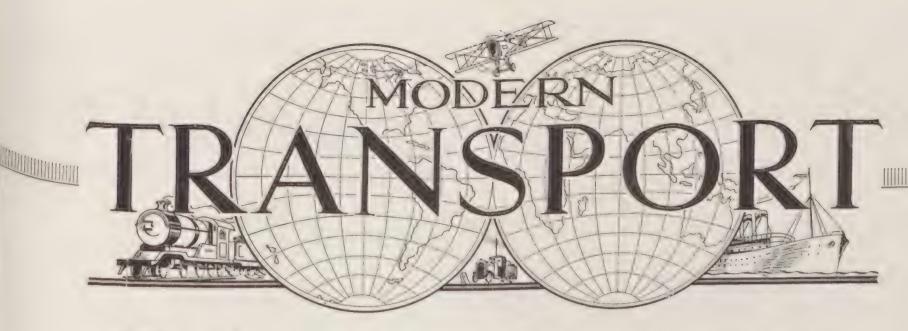
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THE PUBLISHERS' PAGE.

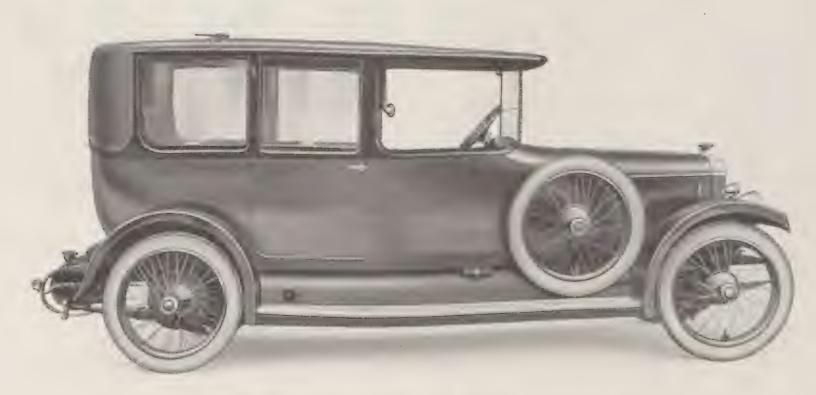
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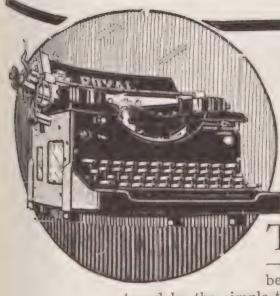
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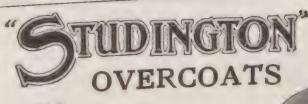
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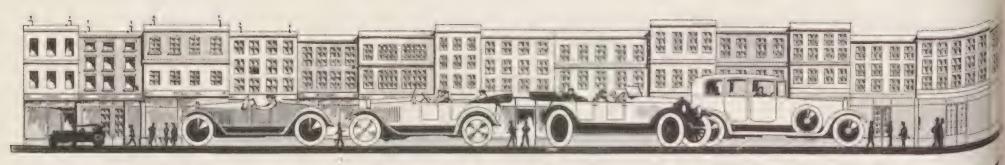
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trades—although it is a usual and admirable custom of the East—has exhibited a striking gregariousness from the first. The principal motor manufacturing district has been, is, and will be, the Midlands; that, with a few exceptions, is where motor cars are made. So with the retail branch of the industry. The principal selling district is Great Portland Street. There, with no exceptions, any

car in existence may be obtained. sequently, it is the Motor Market World.

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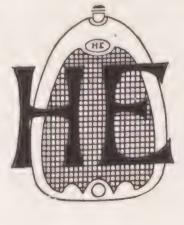
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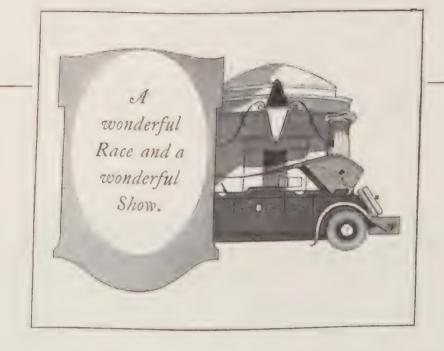
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NOVEMBER 1 9 2 1

C O N T E N T S

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The Editor will be pleased to consider contributions of cherical interest to the car owner provided

The Editor will be pleased to consider contributions of special interest to the car owner, provided they are of high quality and in every way suitable to the magazine. Short illustrated articles are preferred, dealing with any aspect of private motoring, either as regards touring or the home management of the car. First-class snapshots of roadside scenes or incidents are particularly desired. All photographs and sketches should be fully titled on the backs and bear the name and address of the sender.

Contributions should be addressed to the Editor of "The Motor-Owner," 10, Henrietta Street, W.C.2, and should be accompanied by a stamped, addressed envelope. While every effort will be made to return them if unsuitable, the Editor cannot hold himself responsible in case of loss or damage.

INIMITABLE IRENE.

Miss Irene Vanbrugh (Mrs. Dion Boucicault) is acknowledged by all competent critics to be one of the most charming and capable comedy actresses in this country.



MOTOR OWNER 3

AFTER DUE REFLECTION.

"The Motor-Owner" considers Passing Events with an Open Mind.



YENTLEMEN—The Show! We give you that toast with rather more heartiness than would have appeared possible even so recently as two months back. Slowly and surely—and we like the slowness because it spells surety—the motoring industry of this country is recuperating from its bad times. This is the month of motoring matters. Olympia and the White City are looked upon as the Meccas (or does one say Meccæ?) of the entire automobile world—for eight glorious November days. The stream of business, dammed by bad times and end of season inactivity, is loosed once again. The motoring public and motor manufacturers alike share a new optimism. Look around and see it. It is refreshing.

We share this heartening spirit to the full. Yet we run away with no Purile belief in super-optimism. reasoned grounds there is a sure basis for believing in a steady improvement in trade. Our enquiries in manufacturing circles elicit a chorus of gradual improvement, with here and there a dulcet solo of boom conditions. Manufacturers have done well in regard to Price reductions. They have done Well in giving you a wide variety of cars. They offer you in many cases, value for money far beyond the prewar equivalent. An important point that, which you should remember. All these things are the swallows of indication turning the winter of our discontent into glorious summer-or, if not quite that, into something much better than the past year. Therefore, gentlemen, "The Show!"

OUR MASCOT.

We feel that a reasonable measure of pride in Our Mascot is justified. We venture to think that the representation on the front cover will command admiration on all sides. It is the culminating achievement from a long series of efforts to obtain something really artistic of the type.

Most motorists like to have a mascot on their car. Tastes differ as

to types. But many like the charm of the female form divine in one guise or another. And rightly so. You have in Our Mascot, grace and charm, a poise of speed, an indication of exhileration, a presentment of joie de vivre, the breath of speed, and a soupçon of all that goes to make feminine charm. But above all—you have Art.

It is our complaint—we make it with deference—that you cannot buy such a mascot. Some are pretty at a distance—but stand no close examination. Others—ugly, or even vulgar. Why should the motorist who spends hundreds or even thousands on his car, not be able to buy a real work of art as a mascot? We offer what we consider a more suitable design.

And now you know all about the dear little damsel who so charmingly graces our front cover.

POLICE SIGNALS.

In regard to our (i.e., motorists') relations with the police, we seem to be on the upward grade of improvement. Generally speaking, there is now more common sense and tolerance than ever before. Whilst appreciating all that, we yet demand that an improvement should be made in the manner in which traffic signals are given—especially by the country police. It is frequently a matter of difficulty to know whether a signal means come on or stop. Every single motorist should invariably be ready to do all in his power to assist traffic control, by an immediate response to a policeman's signal. At the best the job is difficult and none too pleasant. But the motorist must know exactly what a signal means.

We submit to the Home Office that police signals should be standardised throughout the country. What now only leads to a misunderstanding may soon lead to an accident. It must surely be an easy matter to organise a simple series of movements of a definite type, to be interpreted in a definite way? It must also—surely—be as

easy to get them enforced in the different police areas. Why not get busy, Home Office?

GANG WARILY.

We feel sure you will not mind just a little word of warning about driving carefully? We're all very touchy about our driving-carefully qualities are we not? We may admit comparative lack of experience or even ability—"but, damme, sir, I'm one of the most careful drivers on the road." We all think that, or thereabouts. Yet, maybe, we are not always quite so careful as we think we are.

Therefore, just this note. We have enjoyed dry roads for so long a period, that the skiddy surface comes almost as a novelty. We have grown accustomed in the long dry spell to driving habits which will not do on greasy roads. The point, of course, is to bear this in mind—and not wait for the rude awakening of a bad skid. In brief, "gang warily" until the new conditions have become a habit.

THE FRENCH SALON.

Looking back to the French Salon, it is not easy to visualise precisely what is the collective goal of the French industry. In fact, one could safely say that they indicated no very settled views on the subject. two chief features were extremes. On the one hand was the array of super-luxury cars at exclusive prices. Opposed to these were several new vehicles in or around the 10 h.p. category in which serious effort had been made to reduce prices to practicable minima. In short, the new constructive activity of European manufacturers' aims are two extreme types -the very wealthy and the man of very moderate means.

In our own exhibition one can trace a more unanimous line of thought. There is a strong collective effort to produce a new type of light car of good name, minimum initial cost and upkeep expense. This is a very general

A PRECEDENT IS A DANGEROUS THING.

tendency. We welcome it on many grounds. Yet at the same time, the demand for the typical British high-grade reasonably priced car is by no means dead.

WASTING MONEY.

The present moment, at the tail end of a period of deep depression in the motor industry, it is opportune to study the pro's and con's of any avoidable waste of money. We are tempted to wonder whether the abnormal expenditure of time, temper and money involved in the production of glittering show chassis is any longer justified? So far as the trade is concerned, it is by no means merely a question of money, serious though that be when waste is involved under present national conditions. The dislocation of shops, departmental organisation, and so on are of greater importance to the trade. And what is the show chassis worth to the public? When all are glittering in wholly unstandard finish there is no special attraction to warrant the expenditure of time and money. If one or a few were show finish, and the others standard, the few would command special attention by their exclusiveness.

It is obvious, therefore, that if a

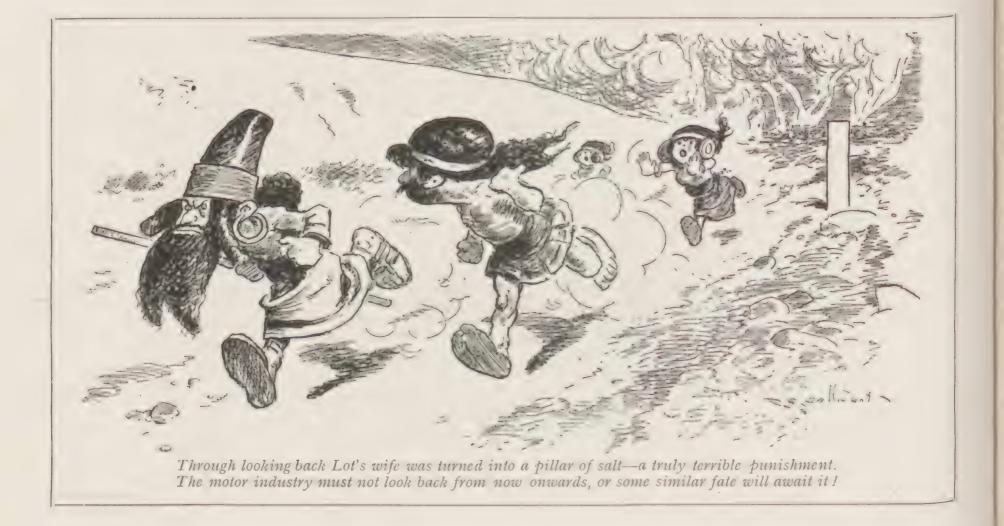
change were contemplated, it would have to be unanimous. It is a point which primarily concerns the trade. But we venture the opinion that if reasonably standard chassis were universally adopted, the change would be almost universally appreciated in trade circles. Then why not make the change and have more time for matters of more serious moment? The public should prefer to study a more or less standard job, such as they would obtain on making a purchase. A nice clear paint finish would appear to be the right thing. The public would in all probability appreciate the change—at any rate, that section of the public who constitute the potential purchasers. We suggest, therefore, that such a change be contemplated for next year's exhibition.

FALLING PRICES.

It is a matter of considerable gratification to notice how prices are coming down in all motoring directions. We incline to the opinion that the bulk of motorists do not yet appreciate the changing conditions to the full. It is much cheaper to motor to-day than it was this time last year. Except for the accursed iniquity of egregiously unjust licence taxation, we have a most pleasing reduction all round in our

purchasing and running costs. Though we (or most of us!) curse the petrol companies for charging a heavy price for their essential commodity, let us, at the least, be just. They have made valuable reductions. We should like to see the price down to two shillings a gallon, but are none the less appreciative of the reductions already made. They are valuable steps in the right direction—and whet our appetite for the next.

Then, again, look how the prices of cars have come down. Look at the reductions in tyre and oil prices. Taken collectively, the trade have more than kept pace with the falling prices in other industries. We can cite you case after case in which you get value for money much more pronouncedly than in the 1914 equivalent. All this is excellent. It is cheaper motoring—and cheaper motoring has been a prime plank in the policy of THE MOTOR OWNER since the inception of the paper. Therefore we most heartily welcome all these tendencies. And we want you to welcome and appreciate them. Like the notice in the fishmonger's shop, "Motoring is cheaper to-day." Forward, then, to that wonderful development of the industry which so surely lies ahead.





AHOY THERE!

Being an Outlook of Matters of Motoring Moment.

ET us have a look round the horizon of matters motoring. There is much to see. Many things may be noted from a casual glance with the naked eye. Others require the searching glare of powerful binoculars, or the intensive magnifying power of a telescope. But all are interesting and instructive. Let us then look round. First of all we have the Show. Even with failing eyesight one cannot miss that! What is the most striking feature there? It is full of all-round excellence. Admittedly—but we would rivet attention on something more than that.

During the past year the British industry has passed through an extremely trying time. It is doubtful when our motoring history has ever seen its equal; and we certainly hope and believe that never again shall we experience the like. Yet what do we observe at the Exhibition? Have these terrible trials to the British manufacturer dammed his energy or initiative? Has he "sort of" just got there with something to show that he is still alive?

REMARKABLE VIRILITY.

Not a bit of it! Never in the history of the movement have you been able to witness such keen activity. Never before has so marked a measure of carefully thought-out initiative been evidenced. Never have we seen more definite proof of the remarkable virility of the British industry. True to that bull-dog tenacity Which has pulled the nation through many a tight corner before, the home manufacturer has grappled with his difficulties. He has met the situation. He has grasped the needs of the momentand acted with promptitude and decision.

You, the bulk of the public, have found industrial stagnation so serious a burden

that you were little inclined to launch out on expensive new cars. Even though you would have faced the initial outlay, you did not want to shoulder the financial drain of heavy running expenses. The British manufacturer has met your requirements. By hook or by crook (we hope not the latter!) he has managed to make valuable reductions in the price of his wares. He has provided you with improved efficiency and reduced running costs. He offers you a fine range of completely new-yet adequately tested—cars, combining low initial cost, and a minimum of upkeep expenditure. He has risen to the occasion in a manner worthy of the industry and the nation. In the midst of what we had conceived to be manufacturing death, he shows a life and constructive initiative never previously equalled. This remarkable virility confirms our strong belief in the coming triumph of our home industry, now that better times are looming on the horizon.

CONTINENTAL TENDENCIES.

It is instructive to study continental tendencies by comparison with our own lines of development. Our neigh-

in the own lines of development. Our neigh- costs

A luxurious cabriolet on a 25-30 h.p. Crossley chassis.

bours seem to have devoted their new constructive activity in car production to two extremes. They have added materially to the number of super-cars, and devoted even more attention to the evolution of the 10 h.p. minimum-all-round-cost type. In the latter category their activity coincides with what many of our own manufacturers are doing. On the other hand, we are not adding to our already excellent schedule of super-cars. On the contrary, many firms of the highest repute are now offering cheaper models.

It would be a pity if this small inexpensive car type should be overdone. When so many rush in to meet a current demand, the fear naturally arises that over-production may be the result. Naturally, it will be a case of the survival of the fittest, and we hold the opinion that a big market exists for the type of car in question. At the same time we hold the view that a material portion of this market will be temporary in character. A man does not buy a £300 car if he can afford to purchase and run a £500 model. Similarly the majority of people would not invest in £500 worth of automobilism when able to afford the costs involved in a fr,000 car; and so

on. Consequently, it is desirable to look forward a little to the time when industry generally shall improve. When it does improve, part of the market for the small inexpensive car will pass to the more expensive type. When one is able to afford what one wants, one generally gets it. In the meantime something else may be used to fill the hiatus.

FRONT WHEEL BRAKES.

We welcome the pronounced French development in adopting front wheel brakes with rather mixed feelings. Right well do we know how excellent they can be. Right well do we know the added



safety they can provide. And right well do we know why we use the word "can" in the previous sentence instead of "do." There you have the crux of the matter. Given good design, proper fitting, and accurate adjustment, the front wheel brake is unquestionably a great advantage. It was proved more than conclusively in the 1914 Grand Prix, when the braking capacity of Lautenschlager's Mércèdes could be observed as much superior to other cars by anyone with eyes to see. Again, this year in the Grand Prix front wheel brakes were conclusively proved of prime advantage.

But in these events you have automatically all the factors we have enumerated as essential to that measure of success. You have excellent design, perfect fitting, and accurate adjustment reduced to a fine art. But if you remove one of these essentials, your front-wheel brakes may become an additional source of danger. To embody all these factors in the construction of a cheap car is a matter of financial difficulty. To ensure accurate adjustment in the hands of the average purchaser appears a matter of extreme difficulty. Yet if you have inaccurate adjustment, that which is intended to provide additional safety may add to avoidable dangers.

Therefore we are possessed of a measure of doubt relative to the wisdom of fitting front wheel brakes to inexpensive cars. It is probable that no unit accessory of a car is as difficult to get right as the front-wheel brake. And if they ever get so adjusted that their application can positively arrest the rotation of the

front wheels, they become a source of danger. That is a cardinal fact. Therefore, before we can welcome their "whole hog" adoption, we should like to see a design in which the user cannot maladjust their action to the degree indicated. Do not, therefore, think that the British manufacturer is unduly slow in this respect. In the words of the man in the street "He has had some." Several years ago a number of British manufacturers—six or seven from memory—fitted front wheel brakes to their show chassis. They were all discarded in six months. The reason is that indicated. It is a matter of extreme difficulty so to design such a fitment that it cannot be maladjusted. The need for care in adjustment cannot be too emphatically impressed upon the purchaser. Granted adequate observance of the points raised, however, front wheel brakes constitute a development of great value to the user.

LOWER COSTS ALL ROUND.

Another point to which we would attract your attention in reviewing the motoring horizon is the question of reduced costs. If we make a comparison with last year, it is found that the cost of motoring has more than kept pace with reductions in other directions. Whether your fancy- and bank balance—run to a super-car, or to the least expensive type, you will find by comparing prices with last year that you can get very much better value for your money nowadays. In fact, it is no exaggeration to say that in many cases you obtain better value than you could in the early part of 1914. Not only, however, are prices reduced, but efficiency (generally speaking) and reliability (fairly generally speaking) are improved. costs involved in running a car have also been reduced handsomely. Whatever you may care to say or think of the petrol companies, the cost of their product is materially lower now than it was last year. There has also been a valuable reduction in tyres and oils.

Of course, there is an outstanding exception in the wickedly unjust taxation impost. By every dictate of

common justice we have a right to look for amelioration in this respect. Whether or no we shall get it remains to be seen. It has been stated that the existing scheme is to be abandoned in favour of a return to the petrol tax. We fear that such an exhibition of sanity is rather beyond the ability of officialdom. But it is possible that we may be granted a reduction of some sort in the heavy nature of the existing impost. The efforts of our different organisations should, we consider, be concentrated in that direction.

ABOUT BENZOLE.

Some motorists have been asking recently "Where is the benzole? The question can only be asked by anyone wholly unconversant with the elements of the benzole problem. The answer to the query "Where is the benzole?" is that it isn't anywhere! That is to say, comparatively with last year, there is very little benzole about-roughly 20 per cent. to 25 per cent. of normal production. The reason, of course, is the late disastrous coal strike and the industrial stagnation. You can only have benzole when there is a demand for steel, and, therefore, for metalurgical coke. Benzole is a manufactured product, the production of which is entirely dependent (bar gasworks output, which at present is economically impracticable) on the demand for steel. Of the 303 blast furnaces working last year, only 47 are now operating. Of over 9,500 coke by-product plants working last year, less than 3,000 are now in operation. In short, instead of having 24,000,000 to 26,000,000 gallons of benzole per annum, we have at the moment

little more than 6,000,000. It is more or less obvious that with so small a quantity, it is economically and arithmetically impossible to have the distribution scheme in force before these upsetting disasters.

The situation, however, is gradually improving, and with the pick up of general industry will continue to improve.

In the meantime, those people who ought to know better should not ask such silly questions.





VERSES AND REVERSES.

After last month's fiasco with this page we spoke to the artist sarcastically about solid heads, and told him he would be thrown to the dogs if anything similar occurred this month. He evidently mistook these remarks for instructions. We must get rid of this artist.



SECOND CRANKING.

I.

WHEN I was young, Long years ago, I always had A thirst to know

V.

To build it up
Again and see
If I could make
It carry me.

II.

The reason why
Wheels turned around.
I'd lie for hours
Upon the ground

VI.

And now that I

Have wandered far

From childhood's days

And bought a car,

IX.

I cannot understand its works. To do its duty it just shirks. III.

And pull my clockwork train to bits, Then make it go By starts and fits.

VII.

My old-time hobby has come back. For hours I lie Upon a sack

X

To drive such things May be a treat. I only know They have me beat.

H. F.

IV.

Then later still
I'd take my bicycle apart
And then would try

VIII.

And gaze aloft
To try and see
Why that darn car
Won't run for me.



SOCIAL CELEBRITIES PASS

Left: Mrs. Chandos de Paravicini with her two daughters, Sheila and Crista. Mrs. Chandos de Paravicini is the daughter of Mr. Robert Lockwood and granddaughter of Lord Lambourne. Centre: Mrs. Arthur Reiss and some of her







RE "THE MOTOR-OWNER" LENS.

famous Sealeyhams, in which she specialises. Right: Mrs. Christopher Leyland and her daughters, Marigold and Pamela, taken at Haggerston Castle. Mrs. Leyland is the daughter of Sir John and Lady Evelyn Cotterell.







CATERING FOR COMFORT.

The most notable feature of the automobile year now starting is the remarkable unanimity of manufacturers in catering for the motorist of moderate means; in catering, indeed, for the man who can afford one car only but who desires to use that one car for all purposes with the greatest possible degree of comfort.

T is usually found by the visitor to both the Paris Salon and the Olympia Show that the automobile industries of the two countries have been working upon parallel, if not upon identical, lines, but this year the issue was somewhat confused so far as Paris was concerned. The general impression left from an inspection of the exhibits was that continental manufacturers, comparatively, lack co-ordination; each is working in a water-tight compartment, without reference to the movements of his rivals, and, consequently, without a true idea of the public demand. The result was that cheek-by-jowl with an almost inconceivably large and elaborate saloon one found a 5 h.p. cycle-car. This contrast was indicative of general conditions.

Here, however, it will be found when the show opens that the majority of manufacturers might almost have been working in consultation with each other; in any case, it is obvious that they have framed their 1922 policies from the same clear facts as to demand. We must always have large, luxurious and expensive cars, but such cars must always be in a minority on the roads. We have already sufficient manufacturers of this type of car; their products, be it said, are recognised the world over as the best that can be produced—not better, maybe, than the best of other countries, but at least no whit worse.

Well and good. But how many times have we been told—possibly because mediocrity usually carries majority with it—that the middle classes are the backbone of the British Empire? Is it not reasonable to argue, therefore, that the backbone of the motor industry is the medium powered and medium priced car?

The more moderate the price, con-

sistent with the provision of a necessary degree of refinement and efficiency, the greater the possible demand for it. This is a fairly obvious fact which the British industry has almost universally recognised—regardless, it must be added, of the fact that such general recognition rather threatens a glut of cars all of one type.

Looking through the very complete preliminary information as to manufacturers' plans which has been placed at our disposal, the first conclusion that we came to was that we were truly sorry for the man who wants to buy a car of 10 or 12 h.p. and who has little previous knowledge of motoring matters. He has a wonderful selection to choose from, but how he is to decide for one particular make is more than we can tell him.

The 11'9 h.p. type of car, of course, is an essentially British product, and the multiplicity of examples is no new



Mr. Frederick Rees has invented a wonderful all-weather body which is likely to be fitted as standard to many cars in future.

The hood is raised by turning the handle seen just above the rear mud wing. It is lowered by hand in the usual manner.

LOOKING AFTER THE ONE-CAR MAN.

thing. That multiplicity is exaggerated this year, however; and still further to confuse the poor "man of moderate means" who does not quite know what he wants, there are a number of new smaller cars of about 8 h.p., by firms of repute, which have every appearance of being very excellent little vehicles. Their capabilities in the way of speed and top-speed hill climbing may be less than that of the larger cars; but correspondingly their price and subsequent upkeep costs are less—and their efficiency is porportionately as great.

This one point—the consideration for our old friend, the "man of moderate means"—is the one great, outstanding feature of the motoring year. It is exhibited in various fashions, and in none more notably than in the recognition of the fact that while the great majority of motorists can afford but one car, they require to use that car for all those purposes to fill which the multi-millionaire maintains a small fleet of vehicles—and they require to use the car in comparative comfort all the time.

The all-weather body is the outcome, and it is to be found in one form or another on almost every stand at the Show. Open, the all-weather body is a perfect touring car for summer use; closed, it is a perfect town car for dull December or frosty February, and the

transformation usually can be performed by a single person in a matter of a minute.

This type of body, as we have said, is a feature of almost every stand. Sometimes it is supplied at the purchaser's option, and, maybe, at a slightly increased price, but again some makers fit it as a standard type of coachwork to one of their models.

In one or two cases, particularly, the idea of all-weather coachwork has been worked out with remarkable ingenuity, the prime necessity of simplicity of erection and complete protection having been admirably combined. In some cases, again, the appearance of the vehicle with the "top" erected is much better than in others. It is not our purpose here, however, specifically to compare the various types; it must suffice to say that a notable step has been taken in the interests of the man who wants and can afford only reasonable comfort and neither desires nor can pay for sheer luxury.

This brings us rather abruptly to the price question. While it is impossible to disguise the fact that "prices are coming down"—and in this respect it is more than likely that some interesting announcements not previously published will be made on the opening of the show—it must not be imagined for a moment that a manufacturer here and there has suddenly

decided to sacrifice the enormous profits that he has been making and to come down to a reasonable price Normally we consider it our métièr to represent the interests of the motor-owner—as our title implies but in this respect we do feel inclined to take up the cudgels on behalf of the manufacturer. No one who has not very complete inside knowledge can possibly appreciate the difficulties of the costing department of a motor car factory in such times as those through which we have passed since the war. We are fully assured that in the majority of cases the price fixed for a car has been a fair price at the time it was fixed. Changing conditions have made it possible to reduce, or necessary to increase, the price, and the alteration has been made. There is another point, however, that is not appreciated, and that is that as the factory does not lead a hand-to-mouth existence so far as raw material is concerned, even though the bottom dropped out of, say, the steel market, it would not be possible to give the carpurchaser the benefit for months.

However, there is no doubt that the level of prices is falling, and whether the reason is a general improvement in conditions as they affect the motor car manufacturer (which is the case) or whatever be the cause, the gain is to the motor-owner.



The hood can be used with or without the windows, and the windows with or without the hood. Even a cold side wind can be guarded against.

Any degree of protection can be secured, and an additional glass screen can be fitted which completely isolates the rear compartment.



MODERN CAR FAILINGS.

No matter how generally perfect the car, it is sure to have at least one small defect. We have yet to meet the perfect car. Generally the failings are of minor significance; but generally, also, a little forethought would have prevented them.

NY reader of THE MOTOR-Owner who spent a day rambling around the Grand Palais and now proposes to do the same at Olympia and the White City must have received the impression that the modern car is far beyond all minor failings, and that, consequently, the above heading cannot be justified. But let him do as we do-drive different cars every two or three of the three hundred and sixty-five days of the year-and he will soon come to the conclusion—as we have—that there is scarcely a car that is perfect and absolutely beyond reproach in any detail.

The failings are usually quite trivial; mechanically the modern car, speaking generally, is wonderfully satisfactory. But what is the use of a vehicle which runs economically and well, and yet is tiring to drive on account of a badly positioned acceleration pedal, an almost inaccessible brake lever, or an engine-oil filler that necessitates the use of a strangely contortioned

funnel?

Haphazard, we should name the following items as possible and simple improvements on almost every car of to-day. No single car, luckily, possesses every one of the faults indicated; but there are few in which at least one cannot be found:—

- Longer brake lever.
 Larger steering wheel.
- 3. Windscreen which does not cause back-draughts.
 - 4. Larger petrol-filling orifice.
 5. Accessible and larger oil-filler.
 - 6. Reserve petrol tank.
- 7. Speed indicator attached so that it can be seen at a glance by the driver.
- 8. Proper accommodation for spare lamp bulbs.
 - 9. Better tool accommodation.
 - 10. Better luggage accommodation.
 - 11. Larger section tyres.
 - 12. Grease gun part of tool kit.
 - 13. Extra air and air-choke fittings.
- 14. Better accommodation for side curtains.

There are fourteen quite common failings, or rather, possible improve ments, which apply to the majority of makes of cars. With regard to point No. 1, it is quite the exception for the side brake lever to be anything but the mean, un-get-at-able little stick that American manufacturers mostly fit; and yet anyone who has once driven a car with a long brake lever so situated that no effort is required to reach it—and, of course, efficient and properly adjusted brakes —will realise what a great difference this small matter makes to the controllability of a car. The lever, when fitted at the driver's right, should reach to the height of the body-side, and the driver's hand, leaving the wheel, should automatically find the

An inadequate steering wheel is perhaps a less common failing, but here again most cars would be improved by the addition of an inch or so to the diameter, while some are really difficult to drive safely on this account alone. An 18-in. wheel on a 10-h.p. car might look a little incongruous, but at least this would be

an error on the right side.

We come now to point No. 3, and so far as windscreens are concerned. we are fairly safe in saying that of all the hundred or so cars we have driven in the last twelve months not a single one has fully satisfied us in this respect. It ought to be possible, even with the long scuttle, raked column and deep seat of the modern car, so to arrange the screen that the occupants of the front seat are protected from both fore and back draughts, but we have found, apart from everything else, that it is impossible to smoke a cigarette in comfort in the usual driving seat. The smoke unfailingly blows into the smoker's eyes; the ash floats away forwards and comes to rest in those of the passenger. This is only a small matter, but it is aggravated when the hood is raised against a sudden shower, and, anyway, when one has paid anything from £198 to

£3,000 for a car it is a discomfort which we ought not to have to endure. Screens are usually amply high and wide; the trouble is apparently only a matter of incorrect design as to horizontal and vertical angles.

There is no need to go categorically through the above list, for everyone who has been cursed with an inaccessible oil or petrol filling orifice would want to add to our remarks. regard to the reserve petrol tank, however, it is so simple a matter to gain the desired result by having two outlet pipes entering the tank to different depths and provided with a two-way tap that it is astonishing more cars are not so fitted. No matter how careful we may be in the ordinary way, we all fall into the predicament of the foolish virgins sooner or later. When we do it is usually in the midst of the Yorkshire moors in the early morning or late at night.

While the inclusion of a speed indicator as part of the standard equipment is quite as it should be, it is a pity that the artistic appearance of the instrument board is frequently considered before the proper positioning of the instruments. The time when one wants most urgently to see the indicator is when one is endeavouring to get the best out of a car and, obviously, the faster the car is travelling the more important is it that the driver's eyes should not be off the road for more than the briefest period of time. All too frequently, however, the driver's view of the speed indicator is obscured by the rim or spokes of the steering wheel; sometimes it is even fitted across on the far side of the

Tool accommodation usually leaves much to be desired. The Rover and Vauxhall ideas of carrying the tools in compartments respectively of the rear-door pockets and the running boards is good, while the attachment of the jack, tyre pump and similar tools to the forward side of the dash under the bonnet, on the Humber, is equally sensible.

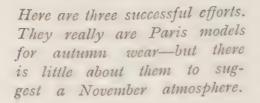
WHEN "JUPE" FORGETS TO "PLUVE."

TRYING TO MATCH THE SEASONS.

Paris dress designers have had their work cut out to combine suitability for the abnormal seasons this year with the type of "creations" the ladies have a right to expect at a given time of year.









MOTOR OWNER 14

THE DAWN OF BETTER DAYS.

The day for unconsidered optimism—or undiluted pessimism, for that matter—is past. We have to look now to a steady, if gradual, improvement to put British motoring upon a sound basis. The views of prominent personalities in the motor world, printed below, are interesting.

Motor Car Show each November those interested in the industry, both makers and buyers, naturally compare present prospects with the past and future. This year, owing to bad trade conditions due to a variety of causes, there is a tendency to sound a pessimistic note. It is certainly true that the industry has been having a very bad time, but other industries have been almost as badly hit, and the present position of trade can only be benefited by everyone concerned sinking their personal points of view and working for the common cause.

The sale of touring cars has diminished in sympathy with the times—that is to say, in sympathy with the taxpayer's pocket. Every one had to retrench when the period of fictitious prosperity that followed the armistice came to an end. Yet, to deal only with the Royal Automobile Club, its membership and associateship roll lengthens steadily month after month, showing that there are many prospective purchasers. As times improve—and there are some who think that next spring will see a great change for the better—thousands of people will want cars for touring purposes.

It is also hoped that the International Tourist Trophy Car Races now being organised by the Club for next year will result in the sale of many hundreds of cars owing to the great publicity which the Club and the Press always give to this event. We have not had an International Car Race in the United Kingdom since 1914, and probably the motor trade will take this opportunity of showing the good qualities of their productions.

On the whole, therefore, while the position of affairs is certainly depressing just now, there is every reason for hope for the future.

JULIAN W. ORDE.

A BIT OF HISTORY.

Better days coming? Most decidedly, yes! Although motoring has not recovered, after five years of war stagnation and two years of "reconstruction," as quickly as I thought and hoped it would, I feel sure that we have now passed through the worst period.

Although the Automobile Association has no connection with that side of motoring which provides the vehicles, the A.A. always knows when automobilism in this country is experiencing fair or foul weather.

There is no magic in this "sizing up" of the situation. To explain, let me dip into history.

About two weeks before the signing of the Armistice, and for the first time in its history, the A.A. went through its first week without enrolling a single new member.

During the war period our membership dropped from 90,000 to 30,000. After the Armistice was signed motorists began to resume their motoring, and gradually our weekly additions to the membership rose in twenties and thirties, up to hundreds,



After all, there is no trick in making the days better. It is purely a question of solid thinking and more solid work.

Let's buckle to!!

and later to thousands, per week, so that on February 16th, 1920, we had 100,000 members. Eight months later we passed the 150,000 mark.

Then came the really bad times—capital and labour at loggerheads, materials scarce and dear, but not-withstanding these adverse factors, we have kept on enrolling members by the hundred.

Let me hark back again, and remind Motor-Owner readers of the arrival of the £1 per horse-power tax; surely one of the most serious deterrents to the expansion of motoring in this country which could have been devised by any Government authority. Notwithstanding the imposition of this exorbitant tax, old-time motorists, and new motorists, continued to clamour for and buy cars and motorcycles at prices more than double those of pre-war days, and if they are not doing so to-day, it is simply because they are imbued with the belief that they can afford to wait until the financial clouds roll by.

And it is because the average motorist hopes and believes that better days are coming, and therefore retains his membership of the organisation of which I have the honour to be secretary, that I, in my turn, feel that you are entirely right in sounding the optimistic note in this issue of The Motor-Owner.

If, as I sincerely hope, the captains of the motor industry, and its many thousands of workers, now realise that the days of fancy prices for cars and motor cycles, and unduly inflated wages, must go, we shall within the next few months see a tremendous revival in British motoring. If the motoring industry can "deliver the goods," at the right price, many thousands of motorists will only be too anxious to receive them.

The welcome announcements which have recently been made concerning reductions in the prices of vehicles, some of which reductions are very tangible, indicate that the hitherto impossible situation is recognised, and that cheaper motoring is very near to us.

In addition to the promise of cheaper motoring, I foresee greater comfort in future motoring. The Ministry of Transport, whatever may be its sins in regard to the horse-power tax, is getting busy in regard to the provision of better roads, good road signs, and the removal of dangerous road conditions. This is another sign of better days.

May I suggest yet another factor which will make the dawn of better days an absolute certainty. Just this! Every motorist who is a keen lover of the open road, and vitally interested in helping towards the attainment of ideal motoring conditions, should support, by membership, the A.A.—the motoring organisation which has always, and always will, concentrate upon protecting him from unjust regulations, unnecessary expense, and trouble on the road.

STENSON COOKE.

FUTURE OF LIGHT CARS.

The British motor industry has never been in such a unique position as it is to-day. Its magnetos are protected by a 66 per cent. duty, and its private car, or ordinary makers, are also protected by a very heavy duty, and behind these duty walls, those classes of goods should build up a trade so as to pay a profit on the money invested, and at the same time be able to conserve their resources and improve their factory equipment.

These portions of the British industry have never been so favoured, and all the success they have made in the past has been against the world's competition. Of course the whole of these advantages may be overwhelmed by the general financial position, but if every person concerned in the industry, who basks in these government favours would realise that they may not be permanent walls but only temporary, and each and all from the managing director to the youngest boy in the works, would make up his mind that he is going to help his particular firm by hard work, long hours and small pay, to get ready for the time when they will have to meet the world's competition again, these particular sections of the British motor industry should boom as never before.

But these favoured conditions must not be utilised to make excessive profits, they must be utilised to cut costs of production and cheapen the cars, so that by the time the world's competition starts, British made motor cars may be able to compete in price with any country in the world.

Given the necessary change of mind, and willingness to make sacrifices in the way of reduced money for both master and man, one can only look forward with immense enthusiasm and belief in the future protected portions of the British motor industry.

In regard to the commercial vehicles -I believe, as I have believed and stated for many years, that the heavy vehicle traffic of this country has got to be carried on pneumatic tyres and in smaller weight units than is usually considered the right thing to-day, and that the commercial vehicle manufacturer should recognise that the value of the motor car is to transport relatively light loads quickly and cheaply. He will then make large amounts of money, while the ordinary relatively expensive and slow moving 3 and 4 ton lorry manufacturers are passing through difficult times.

This same principle of realising that the motor car has to transport light loads quickly at the minimum of expense, will also have to permeate right through the majority of the private car manufacturers, and it is my belief in the immense future of this side of the British business that has brought me back into the industry and caused me to become a director of the A. C. Light Car Company. S. F. EDGE.

A BRIGHT OUTLOOK.

I, for one, certainly look forward to the dawn of a brighter era for the British motor industry in the near future.

So far as the Napier Company is concerned, we have now had an opportunity of our post-war models having been thoroughly tried, and the best evidence of the fact that they are thoroughly appreciated is that in some instances we have been favoured with a repeat order from the same user, and coupled with it a letter giving us the results of their experience in no uncertain terms.

Once this country is through the period of trade depression, I have every hope that those who desire, and will have the best, will be ordering their new six-cylinder Napier, whilst we, on our part, have made every preparation, not only to supply them with what is required, but to give them excellent service.

H. T. VANE.

'ALL WILL YET BE WELL."

It is difficult to visualise the future outlook for the British motor industry. The contrast between the rose-coloured optimism of the days immediately following the Armistice and the pessimism of these dull waiting days is so pronounced, and for many so serious, that it requires unusual courage to again take upon one's shoulders the

mantle of a prophet.

However, as one fully appreciative of his own responsibilities, both to our own employees and to the motoring community in general, I have naturally thought often and deeply on the subject to which you refer. The aftermath of the war has proved to be more serious than anyone could foresee, and since the political stability of the world is the main factor on which all business hinges, the result has been to depreciate the demand for cars to an extent that even now seems inconceivable. Furthermore, this instability of world affairs has been a material factor in creating or increasing the unrest among workers.

These unforeseen events have rendered it extremely difficult to translate thought into action, but the prospective motorist should not conclude from the apparent inactivity of manufacturers during the past three years that they are failing to rise to the situation. On the contrary, many minds and much effort have been devoted to surmounting the obstacles that lay in the path of progress, and I think the near future will provide substantial proof that all will yet be well for present and prospective lovers of road travel.

W. M. LETTS.

DUTY OF OPTIMISM AND HARD WORK.

I note and appreciate your desire to get that note of optimism, and whilst I have a reputation of being an optimist, I often wonder whether this is rightly deserved.

I smile and try to look cheery, because I think that this is one's duty to one's fellow-men. I think it is up to every man, not to be content only to take something out of, but to realise his obligation to do something for, the world in return for the many benefits.

My optimism, however, is rather based on my belief that success is a logical conclusion of hard work, rightly directed, with the knowledge of one's limitations than that foolish optimism which is based on sitting and wishing.

You will remember the two farmers



—one praying for good crops; the other ploughing his field and getting them.

Now, I think that affairs must right themselves, and with them, of course, the motor trade, but only because I have sufficient faith in my countryman to believe that he must sooner or later see reason, and will then act upon it.

The country to-day can, to my mind, be likened to a business man possessed of a valuable patent, which has placed him ahead of all his competitors and enabled him to make a very substantial fortune for himself. The man retired from business and lived on the interest from his investments, until suddenly he discovered that the whole of his investments had gone wrong and his capital was lost. To enable him to live, he must come out of his retirement and commence to work.

Obviously he is not as fitted as he used to be, and must get fitted. Obviously, again, he has no advantage now over his competitor, and therefore he must work as hard as his competitor to live as well as his competitor; harder, if he wishes to live better.

This country was the pioneer of, one might almost say, the invention of steam power, and we had the natural mineral resources to develop the same, with the result that we became masters of the world. We had our patents in our development of steam power, and the rest of the world wanted us almost at any price. This enabled us to build a huge fortune, which we invested in other lands.

Think of the thousands of millions we

must have lost in Russia, Austria, etc. Our exports for many years past have never been equal to our imports-in other words, we have been living on the interest of our invested funds abroad, and before the war—on account of the money we had made over this advantage, and with the interest that that money earned—we were never required to work to the full for our imports as were other countries.

Suddenly we find that the investments are gone. We have blown away something like eight thousand millions. We have wasted millions upon millions more in luxurious nonsense, and we have got now to come out of our retirement and to sit down to really hard work to enable us even to hold our own with our competitors.

As soon as we, as a nation, collectively and individually realise this, I believe that we shall get down to it, that we can beat the other fellow again, if not by invention or our natural mineral resources, then by hard work and intelligent application.

When, therefore, you next accuse me of being optimistic, remember that I am smiling as a duty, and am optimistic as to the future because of my confidence in my fellow-countrymen.

GEORGE G. MITCHESON.

THE LIGHT CAR AGAIN.

The British motor industry, like practically every other industry, has been, and still is, suffering from the general world depression in trade, but I am inclined to think that it is in no worse a position than the majority of other trades, and I feel that immediately there is any serious revival, the motor industry will at once show a corresponding increase of activity.

The past year has illustrated the fact that there has been a very great demand for cars of the lighter and more economical class, and I should think that if it were possible to get accurate statistics as to the number of these cars that have been manufactured and sold during the year, it would show that in actual numbers there are really more cars made and sold in this country than in the years preceding the Great War. During the season, factories have been reported to be producing from 100 down to 40 cars per week, while such quantities in prewar days I do not think were ever reached as a continuous output.

To my mind the future of the motor industry will depend mainly upon the light car, owing to its lower first cost, and also consequently, and if possible more important, considerably reduced running costs. In fact, it is my firm belief that 90 per cent. of the people in this country would motor if they could afford to do so, and in consequence, the lower the price at which a satisfactory car can be sold, the greater will be the industry.

The attention that has been given to the light car since the war has resulted in it being a very much improved form of vehicle.

Until two years ago, in common with many other motorists in this country, my experience, which extends over a matter of nearly twenty-five years, had been practically entirely in connection with the large car, and the occasional runs I used to have in small cars always left me with the impression that they were noisy, fussy, uncomfortable little vehicles. The improvements in the light car, however, I have to admit have been such that, in the well known makes, they are nearly as silent and just as comfortable and speedy as their bigger brethren.

Since the Armistice I have owned and driven several different makes of light cars, and as the result of this experience I find that I prefer, when

there are only two or three to be transported, to use a small car rather than a big one. I find that the average speed is practically the same as with the big car, whilst there certainly is a greater feeling of security owing to the small car being more mobile and controllable, whilst financial satisfaction of knowing that the cost of running is practically infinitesimal in comparison to a big car gives one a feeling of care-free-ness that really enables one in these days to enjoy motoring.

PERCY RICHARDSON.



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together or your watch must be slow. What?"



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St. James's 5



PETROL IN PICTURES AND PARS.

By Capt. E. de Normanville.

A Simple Story of the Chief Items of Interest in the Journey of Petrol from the Earth to your Engine: with other Fuel Facts.

ET me have a couple of tins of petrol, please." How often do we say this to the youth who emerges, mechanic-like, from the garage as the car comes to rest? How little do we stop to think of all the many interesting happenings which have taken place from prehistoric time onwards, to make it possible for

those tins of petrol to be forth-coming—even if we do have to pay more than we should do! And, just strictly between you, Mr. Reader, me, and the garage door, there is the possibility that some good folk motorists would not know even if they did stop to think.

Stirred by this possibility of abysmal ignorance, I have stolen a march on you, and found out some of the more interesting facts. Even the greatest petrol experts do not know all about their own product, so that there is hope for all of us. Anyway, here goes, briefly and without technicalities, for the short story of petrol, and I hope you will find the yarn interesting.

WHENCE COMES IT?

Of course, you've got me guessing straight away if I'm expected to answer my own query "Whence comes it?" A definite reply is one of those things that one cannot very readily offer. Some scientists tell you that originally—say a few million hundreds of years ago-the petrol we now put in our tanks was in the Sun. It "knocked" so badly that a lump as big as our earth broke off-and became the earth, and as it cooled down, large quantities got trapped and remained in comparatively cold storage until "struck" by man. Other scientists show you how silly that yarn is, and tell you that it is of vegetable origin. Anyway, no one really knows, and it does not really matter. You have my august permission to make your own choice.

What does matter very materially, however, is that it is there. In some form or other it can be traced as serving man from the dawn of history. Some one who ought to know once

A "gusher": Many thousands of barrels of crude oil may run to waste before it can be tamed and harnessed to useful work. In this case the derrick has been blown "sky-high."

told me that petroleum bitumen was used in the days of Noah and as mortar in the Tower of Babel. The word "slime" in the Latin Vulgate is translated bitumen. In the British Museum you can study the charm of early Egyptian princesses, embalmed through the ages by the same material. Then you will remember (is it Hero-

Then you will remember (is it Herodotus?) reading of those funny folk Caspian Sea-wards, who used to worship the eternal fires that burnt in the hills—merely escaping petrol gas, lighted by a flash of lightning or some other means. Then the early Chinese records tell us how they dug wells with their hands (presumably on out-crops) to use the petroleum for medicinal and lamp-lighting purposes. So although we are inclined to think of the Oil Age as starting quite recently, it is really as old as you like to make it.

RECENT HISTORY.

One may profitably spend just a moment reviewing the more recent history of this marvellous fluid, so as to grasp how it has changed the mechanical powers of civilisation. The petroleum industry, as such, really started in 1859, when a Colonel Drake "struck oil" in a boring in Titusville, U.S.A. Then the rush started, and production has increased from two or three thousand barrels a year, to some 600,000,000 or 700,000,000 barrels, now-adays.

Then we come to the dawn of motoring and those glorious days of blessed memory when we used to pay sevenpence a gallon for a higher-volatility petrol than is now obtainable. I remember making quite a scene at a certain garage in the Midlands when the price was put up from 9d. to 10d.

WHAT'S A GUSHER?

You have probably seen a picture of a "gusher" somewhere or other. Some good folk think that you just take a hammer and chisel, make a hole in the earth, and up comes the petrol so fast that you cannot even stop it! Well, it's not quite so simple as that. Yet gushers do gush on occasion, and this is how it happens. Underneath

the earth there are—at varying depths—large areas of porous rock saturated with petroleum. There are also gases at great pressure, which naturally exert a similar pressure on these stores of petroleum. It is not very difficult to visualise the rest of the story. Mr. Oil Prospector comes along, and drills a holewhich may be only two or three hundred feet deep, as many thousand, or even more. But eventually this drilling operation reaches the oil. The gas pressure is so enormous that the oil "gushes" up the well, and blows the drills, derricks, and everything else sky high—or thereabouts. Sometimes thousands of tons of oil are lost in this way, before the gusher can be got under control, and the fuel stored in the waiting tanks. One Mexican well "went on the loose" for over three months, actually wasting from 4,000,000 to 5,000,000 gallons every day. Some gusher — and some waste!

VARYING QUALITIES.

But much more generally the crude petroleum has to be pumped up, and not infrequently the drilling ends in a "duster," or, as we should probably term it, a "dud"; you only strike gas—and dust. It is astonishing how these crude oils vary in character and quality. For example, there are many wells in the East Indian Archipelago which yield a beautiful light crude already made up by Nature of motor spirit and kerosene, so pure that it needs no treatment with chemicals. On the contrary, some Mexi-

can wells, owned by the same people, contain comparatively little motor spirit, but a large amount of asphalt. Then again there are wells in the Borneo fields with a geographically conferred advantage which renders that petrol the best in the world. It contains valuable percentages of toluole and benzole, which, incidentally, made it of enormous value for explosives pro-

This is the type of derrick erected for lowering and raising the drilling tools required when sinking an oil well.

duction during the war. But the point I want you to appreciate is that Nature rules the varying quality of the different brands of petrol.

PIPE LINE MARVELS.

So far we have got the crude oil being pumped up from Mother Earth, and stored in tanks. But it has got to be refined, and before it can be

refined it has to go to the refinery-which seems reasonable! These refineries, however, are generally a long way off, frequently on the coast, for export convenience. The crude is sent down through miles of piping, wonderful systems which go up hill and down dale sometimes for two or three hundred miles. There are pumping stations here and there to "accelerate" the flow. In the United States, Russia, and Burma there are many thousands of miles of such piping. On other occasions tank rail cars or tank ships are employed.

Arrived at the refinery, the crude oil once again goes into big storage tanks, usually of something like 2,000,000 gallons capacity. It is here that it begins "treatment" to transform its crudity into the refinement required by our engines. It is distilled—a word which we all know so well in the connection indicated, but which is sometimes found puzzling. Let me put it simply. When you boil a kettle of water, you distil it into the steam which comes off. It is just the same with crude petroleum -except that it is different. The crude oil contains many varying ingredients, or fractions: whence comes the word fractionation with which you may also be acquainted in this direction. Fractionation merely means that the lighter oils distil off at times and temperatures different from the heavy oils—which is natural, n'est ce pas?

GETTING THE GOODS.

The crude oil in practice flows through a series of

SPLITTING UP THE "CRUDE."

stills (boilers) one set a little above the other, and is thus subjected to constantly increasing temperatures. Obviously, therefore, the more volatile fractions distil off first, and the heavy ones last. And that in its simplest simplicity is "fractional distillation," which sounds so complexingly complex. Thus the benzines, or petrol, distil off from the

first boiler, and kerosene, or paraffin, from the later stills where the temperature is

If you let the steam from the spout of a kettle pass through a long glass or metal tube, you know that the vapour will "condense," and that water will drip out at the far end-that is, if you don't tip the tube up the wrong way and scald your hand! It is just the same with the distilled fractions from the crude petroleum. The vapours are led through metal tubes, or condensers, which are cooled by water, or, sometimes, crude oil. At the other end, so to speak, you get your petrol, kerosene, or whatever it may be. By the time they have done their worst with the crude petroleum, it is so disintegrated that you have anything from petrol, kerosene, lubricating oils, or fuel oils, down to bitumen and coke. Though only a rough, wholly undetailed yarn, that is enough to give you a general idea of what happens. The bulk of the oil is distilled in the country of origin, and then cleaned, or rectified, with acids, ready for shipment. But such plants can be seen in this country also, the crude oil being imported from different parts of the world.

DISTRIBUTION PROBLEMS.

One of the many difficulties connected with the petrol problem is that of distribution. Owing to the highly inflammable nature of the spirit, the work involved is highly specialised, and the petrol companies deserve great credit for the fine distributing organisa-tions they have built up.

Petrol is brought across the ocean in tankers, the latest types of which are divided up into a number of separate tanks, so that different types of fuels can be handled in one vessel. petrol is pumped out of the tanker into the storage tanks of the ocean depôts of the country, then pumped again into rail tank cars, motor lorries,

or barges, and so transferred to the

A wonderful engine in which the compression is variable over a wide range. It is used for the scientific testing of different grades of motor spirit. In the larger picture compression is at its highest point; in the smaller the arrow indicates how the compression is lowered by raising the cylinder.

smaller country depôts. From here it is finally filled into the familiar twogallon cans, and once again is redistributed throughout the country.

I hardly think my petrol writings of the last fifteen years reveal me as a keen supporter of the petrol companies. But justice is justice! The distributing organisations they have built up are deserving of the highest praise. When one

comes to go into the matter in detail, the enormous cost of the scheme is apparent. I will not embark on the thorny subject of price, but a careful study of the problem has convinced me that most people's ideas of the working costs are greatly underestimated. I will leave it at that, as we know they make nice fat profits.

There is one other point. You may take it from me that every single tin of petrol when it leaves the depôt contains its full measure, and is leak-proof. The precautions taken to ensure this could not be improved upon. A tin may be mishandled somewhere and develop a leak. But every single one that is sent out originally is a perfectly genuine article.

A REMARKABLE TEST.

Before concluding, I must refer to another point of great interest. It is a remarkable engine in a testing laboratory in the south of England, where research work is carried out for many of our leading car manufacturers. The engine is specially designed for testing the economy and power output of different grades and brands of petrol. You can change the engine's compression ratio by merely turning a wheel, even at full speed and power. You can read the power output, speed, consumption, pinking point, and so on to a minute fraction. In fact, I maintain that it is the most remarkable engine in the world. It cost thousands to

I was privileged to assist at a number of tests and have never been more interested in a motor experiment.

A WONDERFUL ENGINE.

You buy several samples of different petrols in the town. These are then placed in the special tanks, so that by merely turning a tap you can feed different qualities or brands to the carburetter whilst the engine is running. The results were astounding. At a given speed and power you would have the engine pinking like the dickens. Switch over to another sample, and the pinking would decrease. Try yet another, and it would disappear altogether.

It was just the same in regard to power and economical running. You get the engine running at a given speed and power output, on, say, Jones's petrol, and read the consumption at so many pints per brake horse power hour. By merely changing over

to Brown or Robinson brands, your economy increases (you see it and read it off with your own eyes) by anything up to even 20 per cent. And, good my masters, these are the ordinary brands which you buy haphazardly under the impression that one is as good as another. The variations in power were not quite so remarkable, but up to 8 per cent. improvement was not uncommon, and that in itself is by no means an inconsiderable item.

You will be burning for me to tell you t'other from which in all this! But I dislike comparisons. At the same time, the superiority of Shell was so convincingly demonstrated, that justice demands that it should be recognised. Whether for non-pinking

propensities, for economy, or for power, this fuel "delivered the goods" every time. You find the reason for the fact in their Sumatra and Borneo wells, the fuel from which contains a considerable proportion of benzole. There you get your non-pinking, economy, and power characteristics—a kindly gift from Nature.

And put quite briefly and in simple outline, that is the short story of petrol. As you will have seen, its journey from Mother Earth to one's engine is not quite the simple proposition some of us are inclined to imagine. On the contrary it is a very complex problem, calling for an enormous organisation before we can demand our "two tins of petrol, please."





Left: The familiar two-gallon cans are filled automatically—and accurately.

Below: A typical view of storege tanks



Right: Automatic measuring apparatus is also used for filling the large steel barrels.

and distributing pipes at a filling station.

A DREAM "COME TRUE."

In appreciation of the marvellously smooth running of the Packard "Twin Six."

N the beginning man created one-cylinder cars, and saw that they were not good. The internal-combustion engine, more often in those days described as the "infernal-combustion" engine, was regarded as a wonderful means of generating power, but it had as many faults as Government officials.

Very soon engineers realised that to generate power by a series of violent explosions, with perceptible intervals between, is not an ideal method. People do not desire to be propelled, like footballs, by a series of vicious kicks. They prefer to be "dribbled" along quietly.

So engineers soon began to produce engines with two, four and then six cylinders, and found, as they expected, that the more cylinders an engine possessed the more sweetly did it run.

By an infinite number of experiments, and by the expenditure of millions of pounds, some of the cleverest engineering minds of the world have evolved the beautiful power units of the present day which do their work so quietly and smoothly that we can almost forget that their power is still produced by explosions.

After a quarter of a century of work, engineers have practically standardisedfourand six-cylinder cars, but there is one great firm which has not been satisfied that these cars have reached the highest state of perfection. The controlling minds behind this great organisation, which produces ten thousand cars per annum and employs over twelve thousand people, argue that

if a six-cylinder engine runs more smoothly than a four, even better results would be obtained by still further increasing the number of cylinders.

Acting upon this assumption, they astonished the motoring world by producing, in 1915, a twelve-cylinder car, known as the Packard "Twin Six." The name is derived from the fact that the engine consists of two rows of six cylinders each, placed V-wise on the crankcase. This arrangement does not make the engine appear complicated—in fact, it looks simpler than a good many, owing to the clean design.

That is the first surprising impression, for one is inclined to imagine that a twelve-cylinder motor must look rather a bag of tricks. It does not.

Now many of us are old enough to be growing conservative. It is a mental tendency which we should fight. It is so easy to think that, because a thing is done in a certain way by most people, that must be the right way. It is far more likely to be wrong. The truly wise people are always in the minority.

We once heard a lecture by a lady

who tried to convince an audience that the earth is flat. One of her chief arguments was that "people had thought it flat longer than they had believed it to be round," and that even to-day more people in the world had faith in the pancake than the orange theory.

We may laugh at her, but many of us argue just as foolishly. We are, for example, very apt to say that most people in the motoring world have found four and six cylinder cars perfectly satisfactory, and therefore there is no necessity for engineers to try to persuade us to have more cylinders.

The only excuse for such people is their ignorance. If they had ever driven a twelve-cylinder car, they would realise that it has introduced new joys into motoring. It is very difficult to describe the sensation without becoming ecstatic. A twelve-cylinder motor is a dream realised. It is more like a turbine than a throbbing reciprocating engine. It has the sweetness of steam, or the smooth pull of an electric motor.

Think for a moment what it means. Instead of having, say,

four large cylinders in which violent explosions take place, you have three times as many comparatively small ones in which comparatively mild explosions keep up a practically continuous pressure on the crankshaft. For every revolution of the engine you have six firing strokes, instead of two, and, if the car is geared four to one on top, you have twentyfour power im-



A Packard "Twin Six" as a town carriage is just as much a "top gear" car as in its touring form,





ARNIVAL!—What pictures of enchantment the very word conjures up in the mind! The merry, struggling multitudes, kaleidoscopic and ever changing in an abandon of reckless gaiety; its riot of colour; its mimic battle of flowers, its weapons a cascade of rose petals perfuming

the soft night air; the clash of music mingled with the clamour of tongues; the blaze of many coloured lights and the deep purple shadows, contrasting vividly with the calm stillness of the summer's night.

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But one touch is yet wanting to complete the picture, and it is supplied by the arrival of the Queen of the Revels—not drawn, as of yore, by milk-white steeds, and attended by her court of beauty, but—as is more fitting in these ultra-modern times—the chariot of her choice is a PACKARD TWIN SIX. More fitting, because, wherever distinction counts for anything, wherever exclusiveness in personal taste is to be found, and wherever the crowning touch to any scene, however gorgeous, is lacking, the choicest of all cars, THE PACKARD TWIN SIX, supplies it.

Showrooms:
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HENDON, N

Jackard,



pulses to every revolution of the road wheels.

Unless we had been privileged to make an actual trial of one of these cars on the road, we might have been inclined to refer to the "purr" of a twelve-cylinder engine, or might have suggested that the sound would be something like the drone of a very distant aeroplane. In either case the simile would have been false. Sound has been eliminated. When one is driving the car seems to glide like a pedal bicycle coasting down a hill. It seems to run without effort.

In London traffic it is a joy to handle. It will crawl on top gear at two miles an hour, and that wonderful turbine-like engine will revolve in the same effortless manner as when it is turning at speed. From two miles an hour on top gear the acceleration is smoother than anything we have ever before experienced. Again we had the impression that this was not an ordinary internal-combustion engine at all. If the power had been transmitted electrically, it could not have been applied more smoothly.

In order to prove that the slow running on top gear was really as slow as it seemed, we strolled quietly alongside the car for a few yards while it was being driven. Then we jumped in again and watched the speedometer register the acceleration.

Until one is accustomed to the remarkable sweetness of this car, it is advisable to glance at the speedometer now and again. If one does not, the speed is likely to become excessive, because the acceleration is so smooth and the car is so silent and well

sprung that one is very likely to misjudge the pace. It often feels to be gliding along comfortably at about twenty-five miles an hour when the actual pace is nearer fifty.

The "Twin-Six" is essentially a top-gear car. One of them has been driven from London to Scotland and back on more than one occasion without the gear lever being touched except when start-

ing. Even then there is no necessity to make the changes from first to second and thence to top. The car starts quite naturally on second, always in the same effortless manner, and the touch of one finger puts the central change gear lever into the top position where it may stay for the remainder of the run, even if the route lies through cities and over hills such as are only to be found in the north.

There is one feature of the Packard which astonishes every motorist who sees it for the first time. It appears to involve an entirely new principle, for it seems to him at first glance that the gas is ignited before it passes to the cylinders. The average motorist is not accustomed to seeing an auxiliary sparking plug fitted to the inlet manifold, but that is what he sees on When the engine is the Packard. running he may look through the air intake and see this plug sparking amidst flaming gas. It astonishes him because he would as soon expect to see a sparking plug fitted to the petrol tank.

When it is explained to him he learns that this device is known as the "Fuelizer," and its functions are to give easy starting, to prevent carbonisation of the cylinders, and to give more power from a given amount of fuel

The sparking plug is set into what may be described as a secondary combustion chamber which is built into the inlet manifold. A small quantitiy of gas is drawn into this chamber and is fired. The heat of the small exploded charge raises the temperature of the main charge of

gas which enters the cylinders in a dry and perfectly vaporised condition.

This is one of the great discoveries of the Packard designers, and to a large extent it provides an explanation to the fact that these twelve-cylinder engines seem to run for an indefinite time without needing decarbonisation.

When the cleaning process is necessary, say, after a distance of something approaching once round the world, it might be supposed that the task of taking down twelve cylinders would be a difficult and costly one. That is one more fallacy. It is perfectly easy, and can be done in one day. The cylinder heads are detachable, and it is easy for two people to work together on the engine, one on either side, as the two rows of cylinders are quite distinct. work of decarbonising can be done just as quickly as in the case of a six-cylinder engine.

One more illusion to be dissipated is that the petrol consumption must be high. One motorist who visited the London showrooms of the sole British concessionaires, (Messrs. W. C. Gaunt Company, 198, Piccadilly), told Mr. Stephen Johnson, the general manager, that he supposed it took about two gallons of petrol to start up such a car as the "Twin-Six." Mr Stephen Johnson smiled, for he had just completed a tour of Scotland and the Lake District and the petrol consumption had worked out at about fourteen miles per gallon. For such a car, with a particularly luxurious five-seater body, and an engine capable of developing about 90 brake horse

power, this must be regarded as astonishingly low.
For years American car connoisseurs have

American car connoisseurs have regarded the Packard "Twin-Six "as the finest piece of motor engineering in the world. The elect few in Great Britain who have tried the cars are as enthusiastic, and it is significant that there are 44,000 "Twin-Six" Packards in the United States of America,



The touring Packard is a thing of joy in every sense of the word—in its appearance as well as in its running.

THE PRETTIEST VILLAGE IN ENGLAND?

By Felix Rindle.

There are doubtless many "prettiest villages" in the length and breadth of the land. It is largely a matter of personal taste and opinion, but Broadway, in Worcestershire, certainly has a strong claim to consideration.

OME years ago—they may be five-and-twenty or they may be thirty, for time does indeed flyit began to be noised abroadthat is to say, in certain West End clubs and in Fleet Street—that away down in the country there was an ever so pretty village, a village prettier than any in the Home Counties, a village, indeed, that without a note of interrogation was the prettiest village in England. At which some folkman being what he is, many of him argumentative, and still many, by ever so many more, like sheeppricked up their ears, while others, fearful lest they might be deemed lagging somewhat in the rear of what threatened to become a vogue, if not indeed a movement or a cult, accepted the gospel according to the "noisers" without a murmur. With a result that when, a little later, a certain journal, the editor of which had a capital nose for free "copy," started a causerie with the question, "Which is the

prettiest village in England?" a majority of the readers -man, one repeats, being what he isbacked Broadway. After that Broadway got into books as well as the papers, so that conceivably there are good folk to this day who honestly believe that could they but see Broadway they would be assured of a decent death in the four-poster at home instead of a rough-andtumble one in a dry ditch, or, worse still in these hard times, an expensive one in a private nursing home. At any rate it is certain that, with our American cousins.

Broadway, in consequence of the purple patches that it has evoked since the day when Mme. Navarro (née Mary Anderson) went to live there, is become as much a tradition as "Our Mary" herself.

Now I, zestful as I may be in argument, am no iconoclast, and if at this subject, Broadway, I ride a-tilt my purpose will not be to lay the tradition but to amend the terms in which it is expressed. I am, to be frank, one of the numerous band of Broadway's admirers, as you may understand when I tell you that on each of the three occasions on which I have visited the place I have enjoyed, at the Lygon Arms, a most excellent luncheon at what I, a keeper of only a slender purse, on each occasion have deemed a quite fair price. One ought not to confuse æsthetics with gastronomy, nor does one. I beg to submit, however, that a place, be it ever so, ever so delectable, is none the less delectable because it boasts a house for good

eating and drinking, well appointed too, and given to rendering bills that bear a just and proper relation to the things that have gone before. On the contrary, were every town and village—were, indeed, fifty per cent. of the towns and five-and-twenty per cent. of the villages—able faithfully so to boast, England might again be rated "merry."

But one digresses, none the less because the digression is rather of set purpose than wanton. Not the Lygon Arms in particular is one's subject, much less inns in general. It is of Broadway and its proud tradition that one set out to write, and the theme, I do assure you, is a most excellent one, the note of interrogation notwith-Broadway, then, is in standing. Worcestershire, but might be in either Warwickshire, a county in which elms are such common objects of the roadsides that they are locally referred to as weeds, or in Gloucestershire, seeing that thereabouts, in and around the

Cotswolds, North the boundaries of those three counties are disconcerting to a degree. But there it is, the village delectable, the village famous even in far Wisconsin. famous indeed, if the truth were full known, still farther back in the Woolly West, stands at the base of the North Cotswolds, on the west side of them, and is a belonging of Worcestershire, a shire that, however unconsidered by the general, is, you may incline to think, one of the fairest of the forty, if vou ever set out to discover the seven Malverns and suc-



Picturesque cottages in the main street of Broadway.

ceeded, ever rambled through Lord Dudley's domain at Witley, ever happened across, "sudden like," the view of Eastnor Castle from the woody hill above Ledbury, and ever saw the Vale of Evesham in daffodil time. Even supposing you have failed so to divagate and to view, you still may take my praise of Worcestershire on something more substantial than trust if one tells you—as one is about to, "right here"—that a sight of hops is grown in that Midlands shire.

Yet again I digress, and this time, too, not in sheer wantonness. Is it my doing that Broadway is in Worcestershire? Or mine the fault that so many of the fertile acres of that unsung shire are given over to the cultivation of the seductive hop? For anything I have done in the matter Worcestershire might have grown mill-chimneys, as South-East Lancashire does, or have sunk shafts for coal, as Northumberland, and Broadway have been as unlovely a place—to put the case more mildly than it deserves-as Chowbent or as Wallbottle. As it is, even with the income tax at six shillings in the paper pound, Broadway is something to be thankful for, a thing at which to exclaim, it may be, "Selah!" or "Bai Jove!" or "How ineffably beautiful!" or, it might be, "Gee Willikins, guess this is some place!'

Personally I at times incline to think that Worcestershire itself, for

all its pride in the Malverns, is above a bit pleased at possessing Broadway. At any rate here is no case of a light being hidden under a bushel; for Broadway walls in a stretch of the most important highway in the county — the great " turnpike " from London to Worcestershire's storied capital. It is significant, you will allow, that Broad-way should be so placed, but that is not to say that you are entitled to point the finger of scorn at Worcestershire. Between proper pride and inordinate vanity there is a world of

difference, and it is all Lombard Street to a China orange that you, when you have seen Broadway, will admit, quite freely, without a single reservation, that any county—were it Sussex, were it Northants, were it even broadacred Yorkshire-might be proud, quite reasonably proud, to boast such a village. Especially would it ill become a Londoner to cavil at the way in which Worcestershire shows off Broadway. For the Londoner, arriving at Broadway after a journey from his own, his native heath (so to speak), does so in a style befitting an arrival of such import. By that one does not mean to imply that the motor-owner who is a Londoner will find on his arrival at the village at the foot of Fish Hill that the fathers of the village have bedecked the street with Venetian masts and set a brass band a-tuning up in his honour. Bless you, no, not that! What one would infer is that the arrival is ordinarily preluded in proper style, and by "ordinarily" one means supposing the weather has not taken to raining cats and dogs or the Irish Sea set one of its clammy and blotting mists drifting eastwards. Fish Hill is about a mile long, winding, and pretty steep. The bends and the gradient, between them, are to be respected but not feared. From the Fish Inn, on top of the hill, there is a good view, beautiful rather than grand, across the Vale of Evesham, that great market garden, to the Malvern Hills.

A by-way running south from the main road from a point a little short of the inn leads, in about half a mile, to a place where the wold reaches a height a little over the 1,000 ft. line. On it there is a tower that, built in 1797, may well have been deemed an eligible site for a beacon fire in the days when English mothers frightened their children into being good by means of that magic name "Bony," and English fathers took seriously the chances of a French invasion. At any rate the tower is marked "Beacon" on the maps, though to-day it is esteemed as a vantage-point for a view. For my part, I have not stalked the tower. The view from the top of Fish Hill-much the same, it is to be

supposed, as the one from the towerand the views from the descent-continually changing, because of the windings of the road—are good enough for me. Indeed I rate the descent of Fish Hill and the ensuing short run along Broadway's wide thoroughfare as one of the most joyous of my many very joyous road experiences. The hill rounds sharply into the thoroughfare; indeed the thoroughfare, on a perceptible though only gradual slope, may be said to be a continuation of Fish Hill. Moreover, the thoroughfare, besides being wide and sloping, is also slightly bending, so that here are three conditions of picturesqueness ready made. The slope gives emphasis to the brokenness of the outlines, the bend

whets anticipation, and the width lends dignity. As to those outlines, they, with here a lowly cottage abutting on to a tall, substantial house; with here dormers —they may be a pair or they may be a row—and there high gables; with here a house set back in a walled garden, whereas the majority are flush with the pavement; and with here a grass ribbon between pavement and fairway growing a short line of trees, the outlines are indeed very broken. Nor is the bend merely provocative. As it suggests, so also does it fulfil. The "west



The Lygon Arms, Broadway.

end" of the village is at the east end, as, you may have heard, the west end" of Margate is; but the west end according to compass, perhaps unlike the west end without the inverted commas of Margate, is little,

if at all, less a delight.

There, beyond the bend, the thoroughfare widens out on to a little rectangular green bounded south and west by old-fashioned dwellings set behind gardens equally old-fashioned, and, on the north side, by the village thoroughfare, the proud Worcester road, again deflected somewhat from the straight. Between the two west ends, because both are of the King's highway, you are free to choose. My own view is that you will want both, though if you are for prettiness you will content yourself, one fancies, with the geographical west end, not the social. Both are gracious—how very gracious !- but the grace of the one differs from the grace of the other as markedly as the cottage differs from the mansion, the cliffs of Cromer from the North Devon cliffs, and the Falls of Lodore from the High Force and the lower one of the two falls of the Yore at Aysgarth. To put it briefly, the quotation-marked west end of Broadway is stately, so that the graciousness is dignified. The dormers and the occasional thatch notwithstanding, Mme. Navarro's house and others—especially the so-called Tudor House, with its heavy two-storeyed

bay window and three high and massive gables—are too true to the Cotswolds type to be merely pretty. That type, stone, is oftener underadorned — as at Broadway, and as, too, at Chipping Campden — rather than over-adorned. and since, moreover, the one west end is as much Broadway as the other, I would as lief describe the West front of Lincoln Minster "pretty" as Broadway. It is a beautiful village, this Broadway, a very beautiful village indeed; but the beauty is stately, beyond mere pretti the ness. Hence the interrogation mark of

the caption; hence, too, the pricking up of ears to which I have referred. Some of us, old roadmen, knew the place in the days before it was discovered, when motor-cars were not, bicycles evoked derisive laughter, and the horn of the coach-guard might still be heard in the land.

But there, with Broadway what it is—a very proper delight, though too freely mis-adjectived; with the Lygon Arms what it is—a late sixteenth century or early seventeenth century house, transmogrified into a latterday hotel, but not spoiled in the process; with Broadway, too, just within a 90-mile drive from the Marble Arch; and with the weather what it may be-often at this time of year it is much better behaved in the country than the town-one would exhort you to follow the Worcester road, one fine Saturday or other, as far as the foot of Fish Hill; and the next day or, it may be, later return home by a somewhat different route. The Worcester road marches through Beaconsfield to Oxford, whence it coincides with the Stratford road, through Woodstock and the place that is called Road Enstone, in order that it may be distinguished from Church Enstone, a little way to the north from the "turnpike." Then, from a fork 3 miles beyond Road Enstone, the Worcester road bears off to the left, heading for Chipping Norton, where, from a point near the town

hall—islanded in the broad main street—it turns off to the right. About two miles short of Moreton-in-Marsh it passes, in the angle of a road, to the right, a big pillar marking a place where four proud shires meet—Warwick, Worcester, Oxford, and Gloucester. It turns to the left into Moreton, but in a few yards, as if dissatisfied with that place, heads off to the right, and in 2 miles climbs through Bourton, a pretty village, well named "onthe-Hill," on to a windy plateau of the wolds that ends abruptly at the Fish Inn.

The return journey, by my alternative route, works out at 95 or 96 miles. You follow the Stratford road for 4½ miles, and then—by no means before—branch off to the right through Aston Subedge, and a gap in the woody hills, for the near edge of Chipping Campden, a place deserving of a long chapter, instead of mere mention. From a point about half a mile out from Campden there are two ways to Shipston-on-Stour. The high, to the left, by Ebrington, an old-world village, is a bit hilly; the low less so, but gated. At Shipston the Stratford-Oxford road is rejoined. It strides through Long Compton, one of several places where the famous Sir Richard Whittington—thrice Lord Mayor of London, you may have heard—was born, and then toils up Bright Hill, on which, a little to the

right of the main road, is the circle called the Rollright Stones, sometimes dubbed, "The Stonehenge of Oxford-shire." From a fork about 3 miles east of Road Enstone we bear right so as to win to Wheatley, 6 miles on the London side of Oxford, by way of Glympton, Bletchingdon, Islip, and Stanton St. John, unless the afternoon light should be giving out; in that case the main road-Woodstock and Oxfordwould seem advisable. No need, I take it, to labour the advice; and so —a benison on your journey!



The broad main road which justifies the name of the village.



THE MOTOR-OWNER SOUVENIR

OF THE 200-MILES RACF.

In view not only of the tremendous immediate interest and practical value of the recent International 200 Miles Light Car Race at Brooklands, but also of its historic nature, The Motor-Owner has produced a profusely illustrated Souvenir of the event, with a striking cover design in colours showing the winning car and driver. This design is reproduced in ordinary half-tone above. The Motor-Owner Souvenir will be published simultaneously with but separately from this November Number at the price of one shilling. Copies will be on sale at all bookstalls, at The Motor-Owner Stand, No. 223, at Olympia, or may be obtained direct from the Publisher, Motor-Owner, 10, Henrietta Street, Covent Garden, W.C.2., post free for 1s. 4d.



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We welcome your visit to STAND 253 **OLYMPIA** Nov. 4-12

The Motor-Owner, November, 1921



"READY FOR THE ROAD."

The complete equipment of the modern car is excellent, but no matter how complete, each individual owner needs to gratify his particular ideas by the acquisition of "extras."

LMOST all motor car manufacturers list their cars nowadays with a completely "ready for the road" equipment, and little fault can be found with the average interpretation of that term. And yet, how many owners are content to take over the cars as supplied from the factory and to continue to run them without spending a single penny upon additional equipment?

The first week-end run that one takes shows the inadequacy of the luggage accommodation with a full load of passengers, and the impossibility of disposing decently of the spare petrol can. The result is that on the first opportunity a luggage grid at the rear and a petrol can carrier on the running board are added. Summer comes and a tour in Scotland is proposed, and we find that while our baggage equipment includes a fair assortment of portmanteaux, Gladstone bags, steamer trunks and suit cases, there is nothing sufficiently roomy and yet not too large to go on the new grid. So we have to buy a special automobile trunk.

In the course of the run we doubtless get tyre trouble. The spare wheel
proves to be rusty and dusty and is
quite a trouble to attach; we must
buy a cover for it—and then the
second puncture arrives. We mend
the tube by the roadside, and start to
pump it up. Why, oh why, don't the
car manufacturers include a mechanical tyre pump in the specification?
At least we will get an engine-operated
"impulse" pump; in the meantime
even a foot-pump would be better
than the back breaking apparatus
usually supplied.

Owing to the delay with tyre troubles, perhaps we do not reach our destination until well after night fall. If it is a large town, there may be some miles of traffic and repeated switchings on and off of the headlamps to be endured. Again, why, oh why, do not the manufacturers fit a dimmer switch, or at least fix the headlamp switch on or near to the steering wheel? That

will have to be attended to, for driving without one or the other is a misery in the neighbourhood of any large town.

We must imagine that this one day's journey is a particularly unlucky trip. One of the side lamp bulbs blows; the first one knows of it is that a policeman draws one's attention to the deficiency. Why, oh why, do not the manufacturers include a set of spare bulbs in the equipment; or, if one has taken the precaution to obtain a set, why does not the carriage builder include a small compartment in the dash where they can be safely carried? As likely as not if one has spares, when one wants them they are found to be broken.

One cannot exactly blame the car maker for not giving us an electric torch, but it is a very necessary article if one is out on strange roads at night. Something of the kind known to the Americans as a spot light would fill the bill; in the meantime we must at least obtain a "trouble lamp," with plenty of flex, for attachment to the car lighting system in the event of an adjustment or repair being necessary on the road after dark.

There is one other thing that the first few days of ownership will teach us—perhaps earlier in this unlucky first day of our tour we shall have made the discovery that it is impossible to drive with any comfort if the windscreen is obscured by rain drops. There are plenty of preparations which, smeared on the glass, are supposed to keep the screen permanently clear; there are also several simple attachments of the squeegee type. We surely shall not be without one long.

And, talking about luggage, what the dickens can we do with our golf clubs? If there isn't comfortable room for ordinary personal luggage, these certainly are going to add to our difficulties. As a matter of fact, however if we are so keen on the game as all that, various accessory houses will attend to our wants—but it means still another little addition to the "ready for the road" equipment.

Luncheon and tea baskets fall into the same category. They are not things one can expect the maker to include in his standard equipment; and yet anyone who has experienced the superiority of wayside pic-nics as compared with most hotel meals will admit that they are almost essential.

So one could go on almost indefinitely. Most of the things we have mentioned apply to everybody's carthere is nothing, except perhaps the golf clubs, that is a matter of personal taste. When one comes to attempt to deal with that a further wide range of accessories is thrown open. The writer, for instance, while realising that such a thing is a quite unjustifiable extravagance, likes a revolution counter, an altitude meter and a gradometer on his instrument board; another man thinks it indecent to drive with naked springs—he must have gaiters on them, and usually finishes up with a ten guinea set of shockabsorbers as a make-weight. At the same time he very likely has his wheels adapted for larger tyres, and adds a second spare wheel to his outfit. Very sensible, too; but all these small things quickly add up.

Camping out may have been a hobby of the owner in old cycling days—what better could he find now upon which to lavish his surplus cash? He may go so far as to purchase and tow a luxuriously made and fitted caravan, or may content himself with a light tent and a skeleton camping equipment. Whichever it be, his car is not really ready for the road until he has obtained the means of gratifying his hobby.

And at the end, or beginning, of all there is the question of suitable clothing and wraps for the various seasons in which the car may be used—even the fitting of side wings to the wind screen and similar methods of complete protection from the vagaries of the climate. This, however, is so entirely a matter for individual selection that comment here is needless and advice impossible.

THE $C \circ S \circ T \circ C \circ F \circ E \circ C \circ N \circ M \circ Y$.

Injudicious attempts at economy are often more disastrous than a general policy of laissez faire and hang the expense. One thing leads to another; you want to look at the matter from every point of view before embarking upon an economy campaign.

T was a somewhat disturbing fact to some people at the beginning of the year that the figures 1921 added together amounted to 13. Most motorists are supposed to be superstitious, possibly on account of their fondness for mascots; so it is possible that some of them decided to be extremely careful during the almostpast year.

I am not yet convinced that 13 is an unlucky number, but it is certain that thousands of motorists decided that they must be economical, and I believe that many of them have found, as their fathers and grandfathers discovered

before them, that economy may be an extremely expensive hobby. It has ruined many.

Let us consider the case of "A." He has resolved that during the coming twelve months he must reduce his petrol consumption. He argues with apparent reason that if he saves so many gallons of petrol a year the increased taxation will not affect his bank balance. I grant the proposition, but when he discusses his methods I disagree. He began by paying visits to Olympia and the White City on the five-shilling and ten-shilling days to avoid the crowds. He studied every car and learned more about petrol consumption than any one ever knew before. I fear he learned little about the human imaginative faculty—at any rate, it appeared to me that his consumption of stories about consumption of fuel was abnormal.

He became convinced that he must sell his car and buy a new one that would be cheaper to run. He thought this might be done by expending about £220, and of course the saving in petrol would-

The good sense of his wife baulked him. She pointed out that even at the present price he could obtain quite a lot of petrol for £220. He grumbled; said that women had no idea of finance; complained that he was always misunderstood, and paid another visit to Olympia to look at the accessories. He returned with a new carburetter and quite a number of gadgets that were warranted to reduce a car's thirst.

He had them all fitted, and gained an enormous amount of amusement by making consumption trials every weekend. At first it seemed that his car had become a more thoroughly confirmed drunkard than ever, but it was pointed out to him that his methods of measuring the petrol might be inaccurate, so he had a special petrol gauge fitted, and sent his speedometer to the maker to be tested. Then he resumed the tests and drove some thousands of miles in order to obtain fair average figures. At every stopping-place he would consult the mileage figures on the speedometer and check the petrol gauge. He took expert friends with him on these trips, and sometimes, when the petrol consumption figures were low, their spirits would be high and they would celebrate the success of the effort to be economical by sharing a somewhat extravagant lunch.

It was great fun!

Presently his carefully kept figures proved that he had obtained 1.987 more miles per gallon. This pleased him greatly, but he was not satisfied. When an extravagant man becomes economical he is rather like a person who gives up bad habits and becomes virtuous. Both are liable to go too far, and also to boast. "A" boasted, and friends out-boasted. He went to the makers of the carburetter and the other gadgets and complained that he was not getting such good results as other people. They replied that the fault must be in the car itself, and suggested undue friction in the transmission, the wheel, and other bearings. This sounded quite reasonable, so he had his car completely overhauled. The bill was appalling, but as it was incurred in the interests of economy, it appeared to be justified.

He paid, and found that the miles per gallon were now one fewer than before. It was explained to him that this was due to the fact that after an overhaul and renewal of some of the bearings everything needed to be "run in" before the best results could be obtained. So he proceeded to run everything in, taking leave from business for a week in order to make a five or six hundred miles tour.

He caught a cold and returned home in a rage that could only have been gauged by a high-temperature pyrometer. His only consolation was that it was all the fault of his wife. If she had allowed him to buy the more economical car he would have been saved all this worry and expense. He pointed this out to her while she nursed him, and I understand that the order for the new car has now been placed, and that the old one is to be sold at a sacrifice.

I suppose about four hundred pounds will cover the cost of this effort to be economical.

The case of "B" is not quite so sad, but is sufficiently harrowing. "B' is stingy over tyres. He would prefer to run the risk of being held up on the road by tyre trouble, and having to spend nights at wayside hotels rather than buy new tyres when they are necessary. His annual expenditure upon tyre repairs is heavy. His covers are vulcanised until there is little left of the original materials, and the garage hands laugh at them. His tubes burst so often that the repairers call his car "The Better 'Ole."

He also made New Year resolu-tions. Among them he decided that he would do all his own vulcanising in future. He ordered a splendid outfit capable of doing the work of a first-class garage. Certainly this may save him money; but, having decided that he must do all necessary work himself in the next twelve months, he decided to build a new garage, with electric light and hot-water radiators. He explains that if one has a place in which one can work in comfort one does not mind doing little jobs that save money. He thinks it the duty of every one to be economical to-day.

I think of the cost of the new garage, P. A. B. and muse.

THE TROUBLES OF THE GREAT.

ANINTERVIEW.



On the occasion of his seventieth birthday we asked Sir Peter Winterbotham, the world-famous explorer, to describe the most harrowing experience of his adventurous life.



"In my youth," said the explorer, "I had a thrilling encounter with two Bengal tigers which I fought off with my bare hands for two days and six hours. But that was not so bad as—



"My experience in 1881 in the icy waters of Spitzbergen. The sudden parting of an ice-floe forced me to swim for eight days and eight nights in order to regain land, and for the better part of the time I was in extreme peril from hunger-mad polar bears. But I minded that less than—



"The eruption in Taipons of Mt. Winterbotham, which I had discovered and named. To escape the falling rocks and lava I had to run 48 miles, maintaining an average speed of 4 m. 12 seconds a mile. Yet that was not so exhausting as—



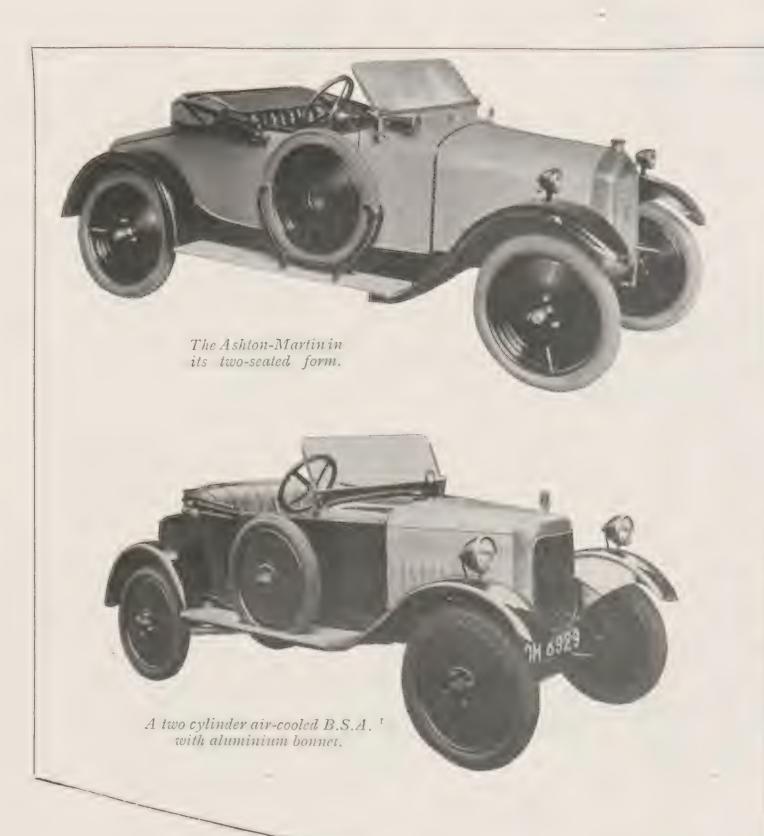
"My capture by the unfriendly M'Jeewees of Portuguese Africa, who bound me tightly to a nearby tree and used me as a target for assegai practice. At the time I thought that must necessarily be my most dreadful experience. But last year I was officially invited to visit, America—



"Where in the course of my three weeks' stay I was made to attend 149 banquets and receptions, received the key of 66 cities, shook the hand of 871,189 persons and listened during 504 hours to 313 speeches of welcome. That, Sir, is the experience that broke my spirit."

THE CULT OF THE

The light car of 12 h.p., more or less, is essentially a British production although of late years Continental manufacturers have shown a tendency to pay more attention to the type. America may almost be said to have





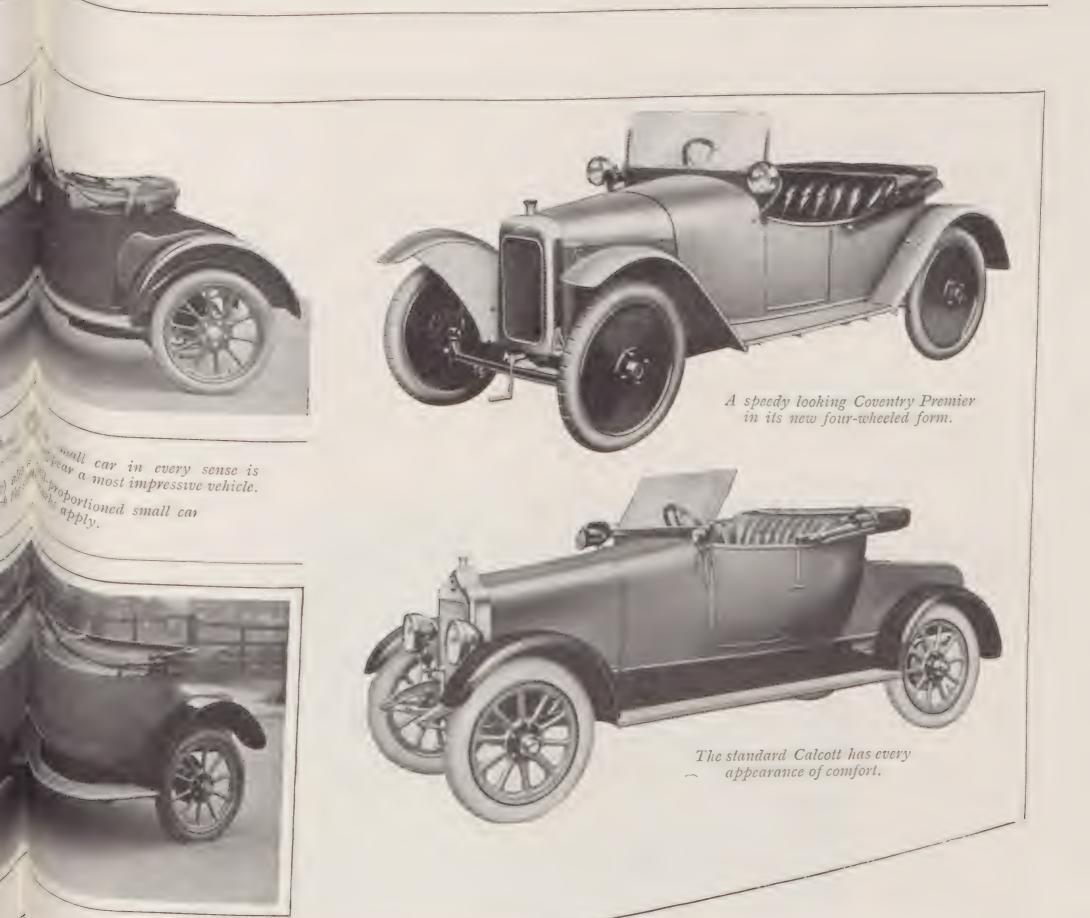
The Wolseley "Seven" (about the excellently proportioned.

The Deemster (below)



TWO-SEATER

completely neglected the light car, for she provides the world with very examples. Britain, in any case, has for once taken the initiative has no reason to fear competition, whether European or American.



AN ADVENTUROUS CLIMB.

By Charles L. Freeston, F.R.G.S.

The author of this thrilling narrative describes the crossing of a lofty Pass which is at all times dangerous, but was especially so from the fact that it was in a state of total disrepair.

OR the most part the great Alpine roads are the finest and the safest in Europe. Engineered on a definite and scientific plan, they present no terrors, as a rule, in the way of surprise corners or sudden descents, and, as soon as the touring motorist has learned how to take a "hairpin," he may go on from pass to pass in the full consciousness that, as has so often been remarked, "there are no dangerous hills in the Alps." The first time, it is true, that he looks down on a tourniquet, or succession of hairpin bends, he may feel affrighted, but he soon realises that they are designed for his own safety's sake, on a careful mathematical basis. If they were not there, the gradient would be too steep to climb, and would be still more formidable when considered as a descent.

But there are exceptions to every rule, and such a one is the Col du Parpaillon, in the South of France, which rises to 8,671 feet and is the highest road in the French Alps. It is not a touring road, nor even a means of local communication, for there is not a single village between the ter-minal points, and I am quite sure that the inhabitants of neither Crevoux nor Condamine ever need to carry anything across. Why, then, does the road-if it can be called a road-exist at all?

For answer I can only state that the road was built by Chasseurs Alpines in 1892, for purely strategical purposes. Geographically it is in line with the Col de Larche, which rises to the Italian frontier, and if Italy and France were to come to blows, the Col du Parpaillon might possibly be of some little use. As a matter of fact, however, it has never been put to any practical purpose whatsoever, and is now not even decently repaired.

I crossed it, however, a few weeks ago, and took some three dozen photographs of the alleged road from bottom to top. And every one of my friends who has seen them has voiced the same question in turn: "Why did you do it?" Readers of THE MOTOR OWNER who examine the illustrations herewith will in all probability echo the sentiment. Inevitably, the pictures suggest that my companions and myself were particularly foolhardy, or else

that we had blundered into a trap through failure to make due enquiry as to the task that was before us.

But I cannot plead guilty to either accusation. I don't do foolhardy things as a rule, and, as for being forearmed, it is the guiding principle of my own touring to know everything in advance that can be known, and the type of tourist who simply "follows his nose" is my particular bête noir. I know every detail as to the altitudes and gradients at different points of the Col du Parpaillon; I knew that it had been crossed occasionally by a car, and all that still required to be learned was the present condition of the route in question. If it were reasonably satisfactory, I wanted to climb the Pass.

We reached Condamine one afternoon after crossing the Col de Vars, and pulled up to ask some bystanders if

they knew whether the Parpaillon road was en bon état. They replied that, curiously enough, the engineer officers had gone out to inspect the route that very day for the first time this year. As Condamine is only a small village. we drove on to Barcelounette to secure quarters for the night, but, after dinner, my friend Mr. C. Scott Lindsay, went back to Condamine to seek out the engineer officers and hear what they had to say about the road.

The report was specifically to this effect, that the road was practicable save at one point, where there



Taking the second hairpin corner above Condamine.

was a large éboulement, or fall of stones. A gang of road men, however, would be starting operations on the morrow, and we were promised that they would see that we got through. To all questions put by Mr. Lindsay, as to the general character of the road, and its suitability or otherwise to so large a car as ours, the replies were invariably of a confidently reassuring nature. sole difficulty, it was definitely stated, was the stonefall, and, if we could not drive through this, "the men would push us over."

On receiving this report I said that I was quite game for crossing the pass, and when, next morning, we found the narrow entrance to the road our prospects seemed bright enough, for staring us in the face was a T.C.F. board bearing the following inscription:-

COL DU PARPAILLON Route practicable pour automobiles.

The least I can say at this juncture is that the sooner the Touring Club de France uproots that board the better. I can only infer that the notice was put up before the war, and that no one had since been near to inspect the post-war condition of the road. Probably it has not been touched for years; at any, rate as events proved, the road was utterly unsuitable for any but the lightest and narrowest of cars, and most of these

would find the gradients and altitude beyond their powers. It was not a question of stonefalls but of unfenced and crumbling edges throughout, and there were times without number on the ascent when it was a lottery as to whether the road would give way beneath us or not.

Relying upon the oral assurances. and the silent but emphatic testimony of the T.C.F. board, we breasted the steep and very rough hill with which the Pass began. Incidentally, I may remark that one was the more inclined to accept the word "practicable" from

the fact that Frenchmen are usually very timid in these matters, their normal standard being the splendid voutes nationales. Taride maps, for example, are plaistered with danger signs on safe roads, and often the word impracticable" is attached to a mountain route that one finds to be broad, well-surfaced and well engineered. Then again, when the Route des Alpes was under consideration, the official reporter to the T.C.F. deposed that the Col d' Izouard was of such a character on the descent that the only possible course for a motorist was to get down and walk! As a matter of fact, I have driven over this road twice in absolute comfort. But if, despite such pusillanimous standards, the T.C.F. declared a road to be "practically". able," how could one assume that it was dangerous?

The first difficulty encountered was the acuteness of the hair-pin corners, but this was only in accordance with expectation. Certainly they were very limited in radius, but I have seen worse, and skill and patience can do wonders even with a long car The wheelbase of our Rolls-Royce was 12 feet and its overall length 16 feet 3 inches, but, bad as the corners were, we never got "tied up in a knot."

Then the gradients, though rising to 15 per cent. over a considerable

portion of the route, were nothing to be afraid of. At the same time, the Col du Parpaillon may rank as the stiffest climb in the Alps, because the very limited number of passes which can show steeper angles are much lower, while the altitude of the Parpaillon road is no less than 8,671 feet. These figures are actual; in every guide book and on every map the height is variously stated, but I obtained my data from the fountain head—the Inspecteur-Genéral of Ponts et Chaussées. The ascent represents an average rise of 514 feet per mile, whereas even the Stelvio itself is only 372 feet per mile.

But the road, as such, out-Heroded Herod. At its widest it measured 8 feet across, and there were places innumerable where a nursemaid might well have hesitated to wheel a perambulator. For the car, of course, it was literally a question of inches on many occasions; but even that would have been endurable if one could have been assured that the soft and unfenced edges would not collapse under the weight of the car.

After rounding seven "hairpins" we crossed the ricketty Pont de Bérard at an altitude of 6,049 feet, and, after passing through a wood, reached the Pont du Parpaillon. Thenceforward, the road wound up a bare mountain-

side, down which stones are free to fall without interruption. éboulement which we were promised was multiplied fourfold. Westruck the first patch pretty soon, and a gang of ten roadmenders and a foreman were at work upon it. They said we could get no further, but on learning that the officers engineer had told us that we might proceed, the foreman agreed to take his gang up the pass and clear away the other three obstructions.

The second was encountered about ro kilometres up. We sat down on the bank for an al fresco luncheon and the



The floor proved to be The mouth of the Parpaillon tunnel (8,671 feet up). covered with ice, and consequently difficult to negotiate.



men divided themselves into two gangs. After the five who stayed behind had eaten their luncheon on the hill-side, they set to work with a will, and the way they wielded their picks and shovels would have paralysed a British trades union workman with horror.

Up to this point the road had been alternately covered with loose stones or completely grass-grown. From the second stonefall onwards, its condition was almost indescribable, for in addition to the profusion of grass and stones the outer edge was more crumbling than ever. We continued the ascent, however-indeed, we could not have turned back had we wanted to-and at a point nearer eight thousand feet than seven, we came upon the third éboulement, on which the other gang were already at work. The obstruction was of considerable size, while not far ahead we could see the fourth, about equal in dimensions.

The road men worked splendidly, and we lent a hand in picking out the larger stones and hurling them over

the precipice; there was nothing below to be hit, nor did the boulders reach the road below before coming to rest. When the third obstruction was more or less cleared and some semblance of a level bed made by pick and spade, we drove over it-perilously, as it proved, for the earth gave way under the offside driving wheel on the extreme edge, the car gave a great lurch, and was within an ace of toppling over. Two of us were on the car, and the other two who saw the lurch, which we only felt, told us that they had given us up for lost, and the roadmen's faces were nothing if not grave.

By the time the last obstruction was cleared away, we had spent four hours altogether from the time of reaching the third. And now all should have been a matter of plain sailing. Unfortunately, it was not so, and for the first time on the journey I experienced a feeling which was absent when I crossed the Channel by aeroplane in 1918, but is known to pilots as "putting the

wind up." About a hundred yards ahead of the final stonefall, the road had crumbled so much at the edge, that the remaining piece of "road" seemed to the eye to be actually less than the car's wheel-track, and just beyond was a hairpin corner of extremely limited dimensions.

There was still another mile of steep climb to the summit, and the road looked so nasty that I warked ahead to see if there were any more indentations. The prospect was not inviting, but I decided that there was no option but to chance it. We wormed our way through the doubtful opening, watching every wheel in turn; it was a matter of inches, or even less, with the possibility of the earth giving way on one side, or the wheels hitting boulders on the other.

To cut a long story short, I may say that we got through without disaster, though I shall not forget that last mile in a hurry. Arrived at the top we saw the remains of a refuge which was destroyed by an avalanche in 1903, and had never been rebuilt, close to the sombre mouth of a tunnel, 1,535 feet long, by which the actual Col (9,310 feet) is pierced. Up the pass we had sweltered in heat, under a brilliant sky; now we plunged into darkness and, after about fifty yards, found the floor of the tunnel to be a solid sheet of ice! This seemed the last straw! There had been moments on the ascent when we had speculated as to what we were to do with the car if we could go neither backwards or forwards; now we seemed destined to be immured in a damp and dismal ice-house. For it was obvious that if the wheels would not bite, the car would be pretty effectually smashed up against one wall or the other of the tunnel.

The roadmen had gone on to have a look at the road conditions on the other side, but I brought them back and spread them round the car to steady it in case of a skid. We pushed it over several hummocks, and for a little way farther when the ice became level; then, applying a little engine

power, and finding that the wheels would bite, we drove slowly through and emerged with releif into the open air.

Now came the problem of getting down the other side. If the road were as bad as on the ascent, it was not a task to be essayed without misgiving. The foreman assured us, however, that it was in better condition, and that there were no stonefalls. He and his men accompanied us to the first corner, where we distributed well deserved largesse and bade them good-bye.

The downward road was often difficult to trace, owing to the rank overgrowth of grass and a perfect riot of wild flowers. One stonefall was encountered, but we bumped over it without mishap. For several thousand feet of fall the Pass was not a little dangerous, but after the slowest journey I have ever known, we at length reached the foot, and wound up the day at Embrun with a record of 39 miles in nearly 12 hours! The car stood the journey in amazing fashion,



Reconnoitring at 7,000 feet. (Note the crumbling edge of the road.)

GREAT MOTOR INDUSTRIES.

No. 1. WOLSELEY MOTORS, LTD.

"The Motor-Owner" reveals some secrets of an amazing organisation.

T was a chilly, grey morning in Birmingham.

The whole world seemed depressed. We had been listening to drab stories of trade stagnation and unemployment, of labour troubles, poverty and hate.

Into this world of "green and yellow melancholy" came a man who smiled. He was an enthusiastic youth who drove a pretty little Wolseley "Ten," and he had arrived to drive us to the birthplace of the famous cars.

If one wishes to know all about the virtues and vices of cars, one should study the facial expressions of chauffeurs.

Power curves, carefully charted on ruled paper, are not nearly so informative as the curves about the lips of professional drivers. This chauffeur's curves indicated forty smiles per hour.

The little engine purred contentedly amidst the traffic of Brum, and the car soared up some of the outlying streets of the city, which have been planned on the onward and upward principle. So, still smiling, we reached the Wolseley works.

It has been our fate to visit many car nurseries. As a rule, they are not attractive places. One would not regard them as health resorts or rest cures. There are miles of machines which automatically lubricate visitors; there is so much noise that a perfectly good battle might be staged in one Portion of the works without the occupants of the other parts knowing anything about it, and there are lurid places where the heat turns one's thoughts to religion. Most motors must be very glad to leave home.

But at the Wolseley works there were pleasant surprises. First we were conducted into a waiting room with exquisite antique furniture—a wonderful room such as one used to see in the stately homes of England, before they were sold up in order that this might be a land fit for heroes to live in. In this quiet room, filled with ancient gems of art, there was nothing but the distant drone of machinery to remind the visitor that he was in the most scientifically equipped modern automobile factory in Europe.

But the moment he leaves that quiet haven, the visitor begins to receive

vivid impressions that he will never forget. The vastness of the works, which cover over one hundred acres, cannot be realised at first. This is not a factory, but a roofed city, with avenues of machinery that seem to extend infinitely. One may walk hour after hour along these lanes which are hedged with throbbing, living machines that seem to be working intelligently, and one finds new vistas opening in all directions.

And everywhere one sees alert, keen-eyed men. There is enthusiasm in the atmosphere. The most vivid impression is that here is to be found

the happiest army of workers in all Europe. The same enthusiasm that lit the face of the driver of the little Wolseley "Ten" is seen everywhere. There is no "labour unrest" here. There is pride in the works, pride in the products of the works. There is loyalty to an ideal.

We talked to many heads of departments. Everywhere we found this happy enthusiasm of men who love their jobs. We lingered in one great shop in which all the parts of all Wolseley cars are gauged and measured. It is a fascinating place. There is an instrument there which makes the one-ten-thousandth of an inch seem an important dimension. It has a scale so finely calibrated that it can only be read with a powerful microscope. It gives one new ideas about accuracy in workmanship.

The ordinary gauges are interesting. If the diameter of a bush is to be measured, a gauge shaped something like a dumbbell is used. One end of the dumbbell is one-thousandth of an inch larger than the other. The



The great machine here shown presses sheet metal into gracefully shaped mudguards.

ELIMINATING THE FALLIBLE HUMAN FACTOR.

tester passes the smaller end through the bush, and then tries to insert the other end which is just one-thousandth of an inch bigger. It if will not go in, the hole is of the right size. If it will go in, the hole is too big, and the part is scrapped. There is no guessing in the manufacture of Wolseley cars. The fallible human factor is eliminated by science. One does not hear "that's good enough," or "that's about right" in these works. Everything is "right" by micrometer readings, or it is scrapped.

The average motorist can hardly realise that one-quarter-of-a-thousandth of an inch can possibly matter. But it does. Take, for example, the tapered needle in the carburetter jet. It is that needle which determines the flow of petrol through the orifice, and upon the accuracy with which it is tapered depends the sweetness and flexibility of the car. Now that tiny piece of tapered steel is more accurately measured than any part of a high grade watch. It is not allowed to be one-quarter-of-a-thousandth of an inch larger or smaller at any part of its tapered length than the size predetermined by the designer. It's makers call it "the soul of the car."

When next you depress the accele-

rator pedal of a Wolseley and feel the sweetness with which the engine "picks up" you will think of that needle, and will bless the scientific manufacturers who do not think the quarter-of-a-thousandth of an inch too small a matter for their consideration.

There are other parts which are gauged so accurately that the temperature of the gauge has to be regarded. You may take a bar of steel which will pass through a certain aperture, withdraw it, hold it in your hand for a moment to warm it, and then find that the minute expansion of the metal has made it impossible for you to pass the bar through the aperture again. Therefore, even that human factor, the heat of the hand, has to be eliminated from some tests.

Very few moterists have even a dim idea of the amount of work that must be done, and the sums of money that must be spent before a single car on a new model can be produced. The Wolseley company think nothing of spending £140,000 on gauges, jigs, and special tools, before they place a new model on the market. This is one of the secrets of their success. They will spend any sum of money on special equipment which will enable them to

cut down the cost of manufacture, and at the same time improve the quality of the workmanship. Their sound financial position enables them to utilize the cleverest engineering brains of the world, and in consequence they obtain labour saving machinery, and build up a scientific organisation, which produce cars of the finest possible workmanship at comparatively low prices.

Any private motor owner who thinks for a moment will realise how he gains by taking advantage of such organisation. Scientific economy resulting from the employment of every known labour saving device, and business methods that keep down overhead charges, mean that the best possible value in material and workmanship can be given to the purchasers of Wolseley cars. They are not "cheap" cars as the definition is usually understood. They are cars of a very high grade produced by such scientific organisation that no better value has ever been offered to the motoring public when the quality of the materials and the workmanship are taken into consideration.

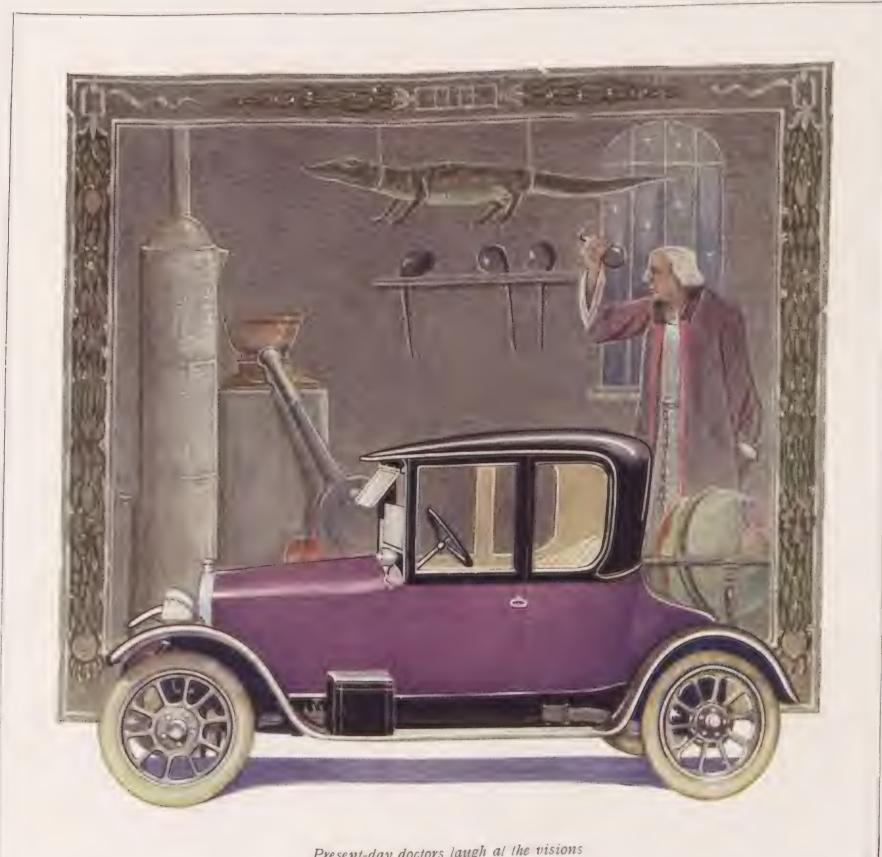
In the early days of the pedal bicycle "boom" most of the present day motorists knew the difference





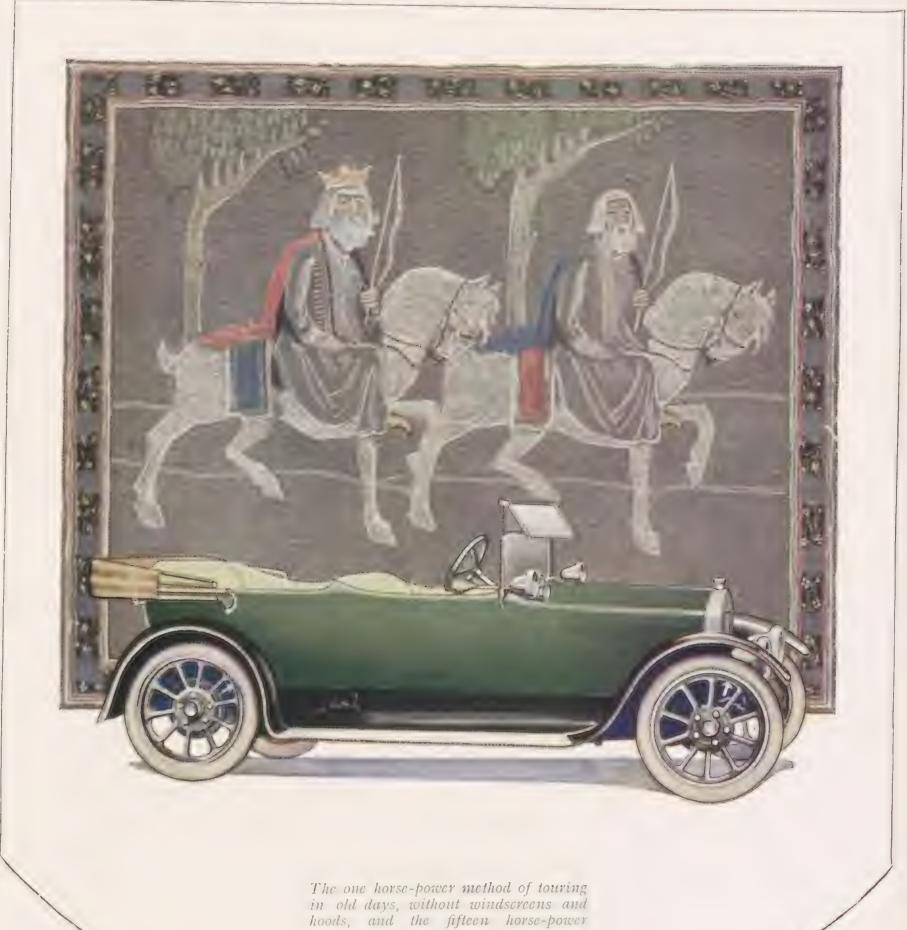
"This is not a factory, but a roofed city, with avenues of machinery that seem to extend infinitely. One may walk hour after hour along these throbbing lanes."

THE MODERN ALCHEMY



Present-day doctors laugh at the visions of the alchemists who thought they could transmute base metals into gold. But they appreciate the success of modern motor engineers who transform metals into such fine cars as the Wolseley "Ten."

ANCIENT AND MODERN



The one horse-power method of touring in old days, without windscreens and hoods, and the fifteen horse-power Wolseley fit for modern Kings and Knights An artist's fantasy.

THE ARTISTRY OF CAR DESIGN



The world has always sought beauty and refinement. Once the polite classes loved tapestries; to-day they prefer the artistry of the car designer. The car is a Wolselev "Twenty" limousine.



A HEALTHFUL HOBBY



The ladies' choice—the dainty Wolseley "Seven," which provides them with a more healthful hobby than the old tapestry work which our artist has used as a background.

A QUARTER OF A CENTURY OF LOVING TOIL.

between cheap assembled machines slung together in some little loft in Coventry, and the exquisitely finished bicycle produced by a factory that had the resources which enabled them to use hundreds of thousands of pounds worth of the most modern machinery. The cheap machine might glitter as brightly at first, for enamel and nickel are cheap, but very soon they begin to fall to pieces. But the pedigree machine, the one that had the name of a great engineering firm behind it, ran for ever. Its nickel and enamel might become shabby, but they could be renovated. The machine itself would never wear out.

Wolseley cars have this reputation among motorists-they never wear out. They are good throughout. They are comparatively low-priced, but they are not "cheap" cars. The they are not "cheap" cars. price has been made possible by factory organisation, and vast expenditure on machinery, and one result has been that in the past year which has been one of the worst ever known in the motor trade, the Wolseley works have turned out a greater number of cars than ever before in their history.

It is not always realised that this company must be regarded as among

the earliest pioneers in the great British motor industry. The first Wolseley car was constructed before the abolition of the law compelling mechanically propelled vehicles to be preceded by a man carrying a red flag. It was a light three-wheeled vehicle built on cycle lines, and it was fitted with a 2 h.p. horizontal motor. Another three-wheeled vehicle was produced in 1897, with a 3 h.p. motor, also of the horizontal type, and in 1899 a four-wheeled vehicle was made, with a framework built of channel steel, a method afterwards copied by practically all makers.

The original firm was known as the Wolseley Sheep Shearing Machine Company, but later, when it had made a reputation in the then new motor industry, it became a subsidiary Company of Messrs. Vickers, Sons and Maxim, Ltd., and had the advantage of the almost unique experience of that

great engineering firm.

Its more recent history is well known, but it seems worth while to recall the early days as they make it clear that the Wolseley firm knew all that was to be known about motor engineering years before the great majority of the present day manufacturers of cars in Britain and America

had dreamed of the possibilities of the petrol engine.

If these facts were not known it would be impossible to realise how such an organisation as the Wolseley works could have been built up. It is not a mushroom firm that has grown in a night. It is the result of a quarter of a century's loving toil. It is the realisation of the dreams of enthusiasts who have put the work of their lives into it. There is romance in every line of its history.

Think of that first car with its feeble two-horse power engine built more than a quarter of a century ago by enthusiastic dreamers in a world that scoffed at the idea of the "horseless carriage." Think of the loving work, the heart-breaking experiments, the original research, and the final glory of triumph as the perfect car has been evolved. To-day one can see pride in the traditions of the firm in the faces of the workers who have the honour to No regiment be Wolseley men. No regiment reviewed by the King ever showed truer esprit de corps than the Wolseley workers when His Majesty visited the vast factory in the dark days of the war and saw the building of the Wolseley lorries, armoured cars, and the famous Wolseley "Viper" aero





"Very few motorists have even a dim idea of the amount of work that must be done, and the sums of money that must be spent, before a single car or a new model can be produced."

engines. Truly, their record is an honourable one. They built four thousand complete aero engines, three millions of shells, and for the Royal Navy they made director firing gear and gun sights that won them special commendation from the Admiralty for their services to the British nation.

Perhaps one of the greatest compliments ever paid to a firm was received by the Wolseley Company during a critical period of the war. Certain very delicate engineering work had to be done which demanded such absolute accuracy of workmanship that most firms would have been afraid to tender for it. The Wolseley Company could trust their men and their organisation. They succeeded.

Now it was customary in those days for the Government to put into factories a small but expensive army of inspectors, who, armed with micrometers, tested every mechanical detail before it was passed for the use of the more highly technical branches of the Services. In connection with this particular work, which was of the greatest possible importance, a highly

placed official who visited the Wolseley works was so impressed by the company's own system of inspection that he paid them the almost unheard of compliment of saying that in their case no official supervision was necessary. If their own experts passed the work he was satisfied that quality and absolute accuracy of workmanship were sufficiently guaranteed.

That is a record of which the firm may well be proud, and the whole system of minute inspection of every tiny mechanical part is in force to-day, just as it was then. The purchaser of a Wolseley car, whether it is the little "Ten," the "Fifteen," or the beautiful six-cylinder "Twenty," has a machine every part of which has been tested by men who have the honour of the firm at heart and are determined to keep up the proud traditions of the past.

This year they will add to the list of their cars a little Wolseley "Seven," the details of which we believe we were the first to see. This little car will be one of the most interesting new models

of the year. It has a horizontally opposed, water cooled engine, actually rated at 8.5 h.p. The gearbox and engine form a unit, the cylinder heads are detachable, the pistons are of aluminium alloy, and ignition is by battery and coil. A very interesting feature is the combination of the inlet and exhaust pipes into a single casting in order that the gas entering from the carburetter impinges against a heated wall which ensures perfect vaporiza-tion. The Wolseley Company are so careful to make no claims that cannot be more than justified that they say little about the low petrol consumption of this little car. We may hint that purchasers need not be vastly surprised if they find it is in the neighbourhood of fifty miles to the gallon.

In appearance the little "Seven will be almost exactly similar to the famous "Ten," which is the same as saying that it will be one of the prettiest of the small vehicles on the road. A feature that will appeal to ladies is that all the control pedals are adjustable to suit the reach of tall or short drivers.

The Wolseley Co. will spend any sum of money on special equipment to cut down cost of manufacture.

The point that will interest the light car enthusiast is that there will be Wolseley workmanship throughout, and we have tried to explain what that means.

The great activities of the firm during the war caused an enormous increase in the size of the works, and to-day all the wonderful equipment of the most modern machine tools that enabled the company to produce in thousands those engineering miracles that we call aero engines are available for the manufacture of cars. The same men who were trained to work on those most beautiful of all examples of modern engineering are to-day turning out Wolseley cars, from the new twin "Sevens" to the lordly six-cylinder "Twenties," and a lengthy visit to the works has convinced us that the same workmanship is put into them all.

The most vivid memory we carried away was one of boundless enthusiasm. It extends from the managing director, through the heads of all departments, to every worker in the shops. The Wolseley Company have never in their history had any trouble

with their employees. The work is done happily in pleasant surroundings. The company are as thorough in their arrangements for good meals, sports and recreation for their workers as in everything else. The Wolseley firm is a small city of happy workers, and happy work is good work.

No organisation in the whole of the great British motor industry more honestly deserves its great success. The year that has passed, and has brought disaster to so many, has left the Wolseley name more firmly established than ever. The coming year will see great developments which we cannot at the moment forecast; but whatever further success is attained will be due to the happy, enthusiastic work of all the thousands of skilled men who are loyal to the name of Wolseley, which in a quarter of a century has become famous in every corner of the world.

We have seen many of the most famous car factories, but none have left happier impressions than those of Wolseley Motors, Ltd.



Look for this Sign:





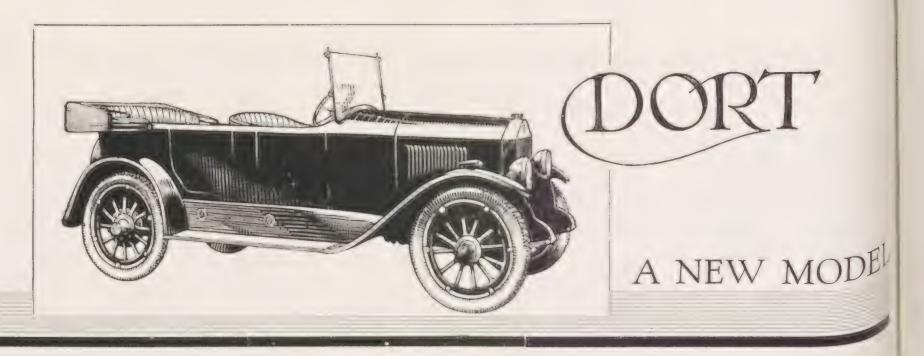
MOTOR SPIRIT

"B.P. means Best Possibleand you simply can't get better."

And every motorist who has ever seriously made a test of the fuels he uses knows this, and sticks to B.P. It is an essentially 'clean' spirit that ensures perfect combustion, and consequently maximum power and mileage.

STAND
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British Petroleum C. Itd. 22, FENCHURCH ST. LONDON E.C., 3



19'6 h.p., 4 cylinders, 3 speeds, electric lighting and starting, 5-seater touring body completely equipped. Spare detachable rim.

INTERNATIONAL
MOTOR
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NOV. 3RD TO 12TH, 1921
STAND NO.
238

1921 HAS BEEN A PERIOD OF VINDICATION FOR THE DORT,

vindication of design, of sales policy, service policy and of the oft re-iterated claims for the mechanical soundness of the car and its wonderful performance. Perfected in chassis design to a degree which has made further improvement difficult to foresee, attention has been directed to the attainment of entirely new and higher standards of comfort and pleasing appearance in coachwork. The new Dort emphasises still further the exceptional nature of Dort value.

Dort production methods have always enabled them to offer value as good as the best and better than most; with their latest production it is not too much to say that they can have no serious competitor.

Write for illustrated Brochure No. 12D.





A Quality Production Car at A Quality Production Price

THE GREAT CHANGE-OVER.

Being the Adventures at the Motor Show of a Family Party on Business Bent.

O you know that this business is going to cost something like six thousand pounds—perhaps more?"

This was the bomb with which the Head of the Family chose to enliven the breakfast table. It did not seem a case for a reply of "Oh, really!" or anything similarly polite and non-committal; they had individually and collectively persuaded the squire to make the great Change Over at last, and although he absolutely refused to part with all his horses he had been brought to see that the automobile played an essential part in modern life and could not be neglected. So they merely looked astounded.

"But, Governor, if we are going to have cars instead of horses, why not go the whole hog?" Thus Wyndham, son and heir, motoring enthusiast, and

somewhat lacking in tact, when the project was discussed earlier.

"Dammit, Sir, I've hunted all my life—do you think I'm going to degenerate into a dashed engine driver at my time of life? Not but what"—fair if choleric, and not altogether grammatical, he added-"I can see that to keep abreast of the times we must have cars of some kind. Ah well, times change, and we don't always change quite so rapidly. Human adaptability is limited. However, that dear old barouche, in which I have gone to the Hunt Ball as long as I can remember, has got to go -to use your modern jargon.'

Wyndham endeavoured to look sympathetic, and succeeded in only slightly concealing his jubilancy.

"Well, my boy, I've given in to the united pressure of my family on all points but one. I will keep my hunters. Beyond that, what cars, and what kind of cars would you suggest that we get? I'll wager you have thought the matter out!"

"Yes, I have, Dad. Subject to your approval, of course, I've scribbled down this list"—handing to the Squire a leaf torn from his note book. "What do you think of it?"

His father glanced through the list

and looked doubtful.

"H'm—seven vehicles. We surely don't want so many. Think of the upkeep, my boy. My income is not what it was—neither, unfortunately, is taxation! And they're going to cost a small fortune to begin with. Well, we can go into ways and means, or I can with my man of business,

later on. Now, how are you going to justify this list?"

"You mustn't forget, father," his son remarked, "that disposing of the horses and vehicles—all except the hunters," he added hurriedly, seeing an antagonistic glint in his parent's eyes—"will bring in a bit towards it. Anyway, as you say, we can look at that side of the question afterwards."

"As to my list; I suppose you will admit that first of all we want a big family touring car—a Rolls, Napier, Lanchester, or something of that kind?"

"Yes, certainly, but that's only one.

How about the other six?'

"Well, you wouldn't use a 50 h.p. open touring car for running about town and so forth—or at least, the mater wouldn't. You must have a nice little laudaulet, or an electric brougham, or something, mustn't you?"

"I suppose you're right. Well, go on."

"The landaulet will be fine for taking us to the theatre and all that sort of thing. And the mater will be able to do her shopping in comfort, and do all she wants to do each day, in the day. That'll be a relief, won't it, Guy?"

"How many times must I ask you to be more respectful? This modern clipping of words and phrases and general use of slang is most obnoxious to me."

"Sorry, Dad; no harm meant. Carry

"There you go again! Ah, well; it will be a great advantage to your mother, doubtless. And to me," he added, sotto voce.

"But, Dad, what will you be doing in the



The rear axle of the new Singer Ten. It will be noted that the gear-box has been shifted back to the conventional position amidships.



meantime? Will you toddle round with mother on her shopping and calling rounds, or take a taxi to your club, and another to the city—and another back to the Club for lunch, and still another home?

"Eh, what? Why shouldn't I use the electrolet or landaumobile or whatever you call the damned thing?"

"Now, Pater, be fair and reasonable. You can see that Mother's wishes and yours as to the use of that particular vehicle wouldn't run along the same lines very often, can't you?"

"H'm, no they wouldn't, would they?" Looking a little crestfallen, he added; "I suppose you're right—taxis for me!"

"But why, Dad, when we've got cars of our own? Have you realised that your casual taxis would cost you something like a fiver a week, and that a neat little coupé wouldn't cost more, once you've bought it?"

"Oh, that's what you're leading up to is it? That's number three on your list, I see."

"Yes, Dad, that's number three—your own personal car."

"Not a bad idea. But I can see the individual members of



Captain Black "demonstrates" the Hillman coupé. Note the tipping front seat and the wide side door.

the family having one each before you have finished. Go easy, my lad—my pocket is not inexhaustible. However, let me hear the worst."

"We're nearly at the end of it, Dad. There's only myself and Ethel left. We could each do with a little two-seater, of course—II'9 or thereabouts. Something nice and quiet—sort of pony carriage—for her, and a sporting model, guaranteed-to-do-80-at-Brooklands for me."

' I 'suppose that's reasonable—but thank Heaven you've finished."

"But I haven't, Guv—Governor, I mean. You will certainly want a smaller touring car, a 15'9 I should say, and what about a luggage car for house parties and all that sort of thing?"

"Wouldn't it be cheaper to use a horse and cart?"

"Yes, perhaps it would, as you're keeping the hunters—use one of them, you mean?"

"Use one of them, you darned young idiot—are you crazy?"

"Hush, Father—that's what Euclid called a reductio ad absurdum! If you are changing over to motor traction, you'll find it



The Hillman all - weather coupé when closed is to all intents and purposes an interior-drive saloon.

When fully opened, an operation occupying very few seconds, the coupé is an equally satisfactory touring car.

LOOKING FOR LIGHT CARS.

better and cheaper to make a job of it, as it were—and you will find a 10 or 15 cwt. van a sine qua non and its job no sinecure.

"Is that all?" asked the Squire in a crushed tone. "Because if so, leave me to it. I will see how far your programme is possible."

And so, having "talked it over" with his man of business, the Squire launched his little bombshell at the breakfast table on the morning of the opening of the Motor Show. The family, and especially the two younger members thereof, were excited at the prospect of visiting the Show later in the day and of choosing their seven cars, for they considered the selection to be entirely their business, the parents' part being merely to make out the necessary cheques.

Arrived at Olympia (en automobiles, hired, one) the party forgathered 'neath the clock and endeavoured to form some plan of campaign—for the purchase of seven cars, each of entirely different type, promised to be no light task.

"Look here, Dad," said Wyndham, "supposing Ethel



The problem of tool disposal is always difficult to solve, but the Enfield-Allday people have hit upon a good solution.

and I roam off on our own for half an hour, just to get the hang of things? We'll meet you here in thirty minutes exactly. You can look at the big tourers and the coupés and landaulets while we keep our weather eyes on two-seaters and 15'9's. How'll that do?''

"Excellently, my lad; but I shall want your advice when it comes to buying, you know."

"Sure; bye-bye, parents! Come on Eth."

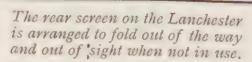
They strolled down the nearest aisle together, leaving their father and mother somewhat bewildered, but not altogether displeased, with the light and bustle, and the prospect of spending lavishly for once in a way.

way.
"Have you any idea of the make you fancy, Windie?" asked the girl. "I suppose the car that is supposed to satisfy me won't be sporting enough

for you?"

"Oh, I don't know. If you have a standard A.C., Hillman, Morris, or any one of a dozen more, that should be just what you want; I expect that the special sporting model of the same make would be about my







When erected the screen gives better protection for the rear passengers than most of the devices of the kind that we have tried.



mark. However, there is the A.C.

Let's go and look at it.'

" It is a pretty car-and oh, Windie, I do like that shiny body! What is it—aluminium?

"Yes, that's the sporting model; mine, not yours!"

"What's the difference, then?"

"Why, the 'shiny' one, as you call it, is a good bit faster, and probably from your point of view, not quite so comfortable. Not that it's uncomfortable, mind you, but you'll want to use your car for making calls and shopping, probably, and the garments, and especially the headgear, that are suitable for that sort of thing would hardly do on a 'speed bus.' No; stick to standard models, old girl-you'll find them more suitable in the long run."

"I suppose you think I'm not to be

trusted with a 'speed bus'?''
"Not at all, but you're less likely

to want speed so much as comfort, and you'll get more of it in a standard." "All right, I accept your apology.

But come on—we've only got half an hour and I particularly want to see the Calcott and Alvis cars; you didn't mention them just now. There's the Morris."

"Yes, and there's another 'shiny' sporting model. I don't know that I altogether-like the idea of keeping all that metal clean. You'll have to lend

a helping hand, Ethel!'

"Oh, of course! Anything else you'd like? Perhaps I could buy the petrol and pay your fines for you, too? But as a matter of fact, two girls I know have got aluminium bonnets to their cars, and they say it's guite easy to keep clean so long as you don't use metal polish.'

"That's a good tip. What is the

proper thing to use then?

Just soap and water, I believe. But what's the power of the Morris?"

"They call it 11'9, but as the bore is half a millimeter bigger than the usual 69 I suppose it's a bit more. Anyway, the taxation is £12 a year, so it doesn't matter much. But I want to find out the difference between the Morris Oxford and Morris Cowley.

'The Oxford is a sort of de luxe model, with an electric starter and all that sort of thing, that's all. I suppose the Cowley would be good

enough for me?'

"My dear girl, have I ever given you the slightest cause to speak like that, even if you are my sister? Didn't I use to eat up your chocolates so that you shouldn't get tooth-ache?"

"Yes, you 'did use'-won't you

ever learn to speak English decently? But you're a dear old thing if you are

"H'm. Rather a doubtful compliment—there's the Hillman: come on kid, I've had my eye on that for a long time. Suitable for either of us in its different varieties: more aluminium, by the way.'

"Yes, they're all fond of it. Suppose it's the fashion. The Hillman is an

11'9 too, isn't it?"
"There or thereabouts. I like it, Ethel. The standard two-seater looks quite nice for you, too. By the way, the papers have been talking a lot about the new small cars - the Wolseley, Belsize and B.S.A. two-cylinders, for instance. How do you think one of those would suit you? Then there's the Rover, A.B.C., Jowett and lots of others, so far as that goes.'

"Well, I don't know why you should have four cylinders and me only two. Still, Belle Harding's Rover has been quite satisfactory, and there seem to be thousands on the road. Air cooled,

isn't it?'

"Yes, so's the B.S.A. The Wolseley is water-cooled, and the Belsize oilcooled. I want to have a look at that, it's interesting. The cylinders are

(Continued on page 51.)



The power and gear unit of the new B.S.A. light car. Note the position of the magneto and the overhead valve covers. The latter should tend to silence what is usually a noisy, if efficient, type of valve gear.

MOTORING "SWIFT"-LY IN ALL-WEATHER.

The new Swift Twelve with the standard all-weather body provides a car for every purpose on a single chassis.

FEW wealthy motorists who are not watched too closely by the tax collectors are able, even in these stony-hearted times, to keep a number of cars. They have some for fine weather, when the sun shines, some for days that are slightly diluted, and other designed on the submarine model for days that are entirely fluid.

But even these motorists are not entirely happy. There are patchwork days when the meteorological reports prophesy "fair, local showers, some thunder, snow in places, rising temperature, but frost at night. Slight earthquake tremors."

On such occasions the millionaire motorist orders his hermetically sealed submarine, and the day proves to be the finest and sunniest of the year. Then does the millionaire gasp and wish that water-tight cars were fitted with turrets through which the owner might come to the surface to breathe.

It is pleasing to know that even the very wealthy have their trials.

There are hundreds of thousands of other motorists who have only one car apiece. Most of them own open touring

cars, and are in a position to know exactly what the modern writer on social problems means when he refers to "the submerged classes."

What these motorists really require is a moderately priced car that can be adapted to the one thousand and one types of weather of which the British climate is composed.

His requirements do not even end here. He wishes to use his car for different purposes. At times he may wish it were a two-seater; at other times he desires it to carry, four or even five. Sometimes, dressed in

motoring tweeds, he wants to tour Great Britain or the Continent, and at others he wishes to take a party of ladies and gentlemen in evening dress to a dance or a theatre.

It seems impossible that one vehicle can serve him in so many different capacities.

Many designers have endeavoured to produce an inexpensive all-weather body, and at last one firm has succeeded in giving the motoring world that for which it has been waiting so long. The honour must be given to Swift, of Coventry, Ltd., and recently we were permitted to see the first specimen of an entirely new type, which will soon be seen in thousands on the roads.

It is to be standardised on the four-seater Swift "12" for the 1922 market. The new all-weather body adds nothing to the cost, for the price of the complete car, which may now be converted in a few seconds from an open touring vehicle to a limousine, remains at £595. The new all-weather body is a free gift to purchasers of this well-known car.

One of its charms is its extreme

simplicity. It is only when one recalls the many clumsy efforts that have been made in the past that one realises the clever way in which all difficulties have been overcome.

The car in general appearance remains the well-known open, touring four-seater with graceful lines. There is nothing whatever to destroy its symmetry. It looks just a handsome touring car for butterfly motorists on a summer day.

But out of sight, snugly tucked away beneath the front seat, there are two long side windows made of celluloid that is as transparent as glass. In a few seconds these windows can be unfolded and placed in position on either side of the car, and in a few more seconds the hood, made of black, perfectly waterproof material with an inside lining of dark grey, may be erected. The car now becomes one of the entirely enclosed "saloon" type.

Without previous instruction we were able to place the side windows in position and erect the hood single-handed. This is the best possible evidence of the ease with which the operations may be performed.

Having thus converted the vehicle from an open touring to a saloon car, we climbed into it. found that all the side windows were hinged, so passengers and driver have no difficulty in getting in or out. At the base of the central windows we found little flaps through which the hands might be passed in order that signals might be made while driving to other users of the road.

Incidentally, it may be pointed out that a lady using this car for shopping excursions could hand out money and receive small parcels through one



The All-Weather Swift Twelve as an open touring car—a condition from which it can be transformed into a limousine in a few seconds without previous instruction.







of these flaps without having to leave her seat or open one of the doors of the car.

So far we have seen the car entirely open and entirely enclosed. But there are two intermediary stages, and not until these have been demonstrated does one realise the full advantages of the new all-weather Swift car.

One set of side windows may be used as a wind screen for passengers in the rear seats, and they are then even more completely protected from wind and dust than the occupants of the front seats who sit behind a double glass screen. There is a small apron which buttons to the rear screen and entirely excludes the wind caused by the forward motion of the car.

On most cars such wind screens for passengers in the rear seats have been regarded as luxuries which justify a considerable extra charge. The purchaser of the new Swift "12" obtains this additional luxury for nothing. Moreover, this rear wind screen has a quite pleasing appearance, for it is sloped in such a manner that it does not destroy the graceful lines of the entire car.

If even fuller protection from wind is desired the two side windows may be placed in position and clipped firmly to the front screen. The four occupants of the car then sit within a space three sides of which are enclosed, though it is open to the sky. They are all equally protected from wind and dust, yet

MOTORING SIII A feature of the coming place being paid on all hands category, as a matter of the of automobile users. bodies now appearing po of the new Swift In





ALL-WEATHERS.

the one-car man," a street of the all-weather in an index the wast majority in the is undoubtedly that of which appear in

have a clear view in all directions of the country through which they are passing. This arrangement will strike most motorists as an entire novelty. That ladies will appreciate it is certain. One of its advantages is that conversation is possible between the occupants of the front and rear seats, which it is not when the conventional type of rear wind screen is used. Again, it may be said that the appearance of the windows when placed in this position is by no means unpleasing.

Yet another improvement to the body of the new Swifts is the introduction of arm rests at each side of the rear seats. These are so designed that they do not in any way interfere with

the seating capacity, though they add to the comfort of the occupants. The rear seat is still sufficiently large for three passengers of normal size, so the car may really be regarded as a five-seater. There is an exceptional amount of leg room, and for 1922 the makers are fitting adjustable foot rests which will still further add to the comfort of the passengers in the rear seat.

No material alteration will be made to the chassis of the 1922 Swift cars, but the design of the radiators has been slightly modified. Instead of being square, the actual radiating surface is now curved at the top, and the effect is distinctly pleasing.

The great charm of the new allweather equipment is its combined



simplicity and effectiveness. For some years past we have periodically ridden in cars in which an alleged all-weather top was fitted, and we have found them to suffer, almost without exception, from one or other of two faults. Either the equipment, if effective in affording real and complete protection not only from rain, but from draughts as well, was complicated, and required an expert to affix it, or it was easily affixed-and neither wind nor water proof. The result was that one became thoroughly wet and cold before all the curtains were in place-and one was not then in a condition to appreciate the comfort in which thenceforward one could drive; or, knowing the searching draughts that would arise so soon as the hood was up, one put off the evil moment until it was proven beyond doubt that the rain was more than a passing shower. And, again, by that time one was already wet!

There was usually a further fault. The side curtains were provided with mica windows, but the dimensions of the transparent material were small, and to travel any considerable distance had a most depressing effect upon the passengers. Finally, if the car had to be used in London or any large town, it was almost impossible to use all four (or six, as the case might be) of the side curtains, since that on the driver's immediate right prevented him from signalling his intentions to other traffic. And to drive with one

curtain off deprived the car of any weatherproof qualities it may have possessed.

All these points appear to be provided for in the Swift Twelve All-weather equipment. There is, first of all, plenty of head room and plenty of light—as much of either, in fact, as one could obtain in the most expensive of saloons. As we have already said, the fixing of the hood and curtains does not require fore - knowledge - it can be accomplished rapidly and unerringly by anyone possessed of ordinary common sense. And the comfort of the closed body is such that one would

cheerfully erect it on even a merely cold day, instead of postponing the operation until forced by sheer necessity. The final point is dealt with by the convenient flaps, through which the hand may be projected to indicate the coming movements of the car to other drivers.

We have encountered many ingenious fitments of one kind and another both in the motor world and elsewhere, but as a general rule we look askance at compromises. Usually they fulfil both or all the purposes for which they are intended to a limited extent, and, from previous experience, one would expect to find that the all-weather car was neither so good, open, as a straighforward tourer, nor so effective, closed, as an ordinary limousine. But the Swift people have by some means produced a compromise which meets all demands in irreproachable fashion, and for pure ingenuity would be hard to heat.

For the benefit of those—and they are possibly comparatively few—who are not already acquainted with the main points of the Swift chassis, we will mention a few of the more important details.

The engine is what is commonly known as an "II'9"; that is to say, it has a bore of 69 mm., but as the stroke is 130 mm. the tetal cubic capacity of the engine, and consequently its capabilities, should be rather above the average for its type.

The four cylinders are, of course, cast in a single block in conformance with modern practice, and the arrangement of the carburetter, magneto and the various accessories which cannot be actually concealed is such as to ensure accessibility combined with a notably clean appearance. Lubrication is by a gear-driven pump situated in the base chamber, and the magneto drive is by chain. Thermosyphonic circulation is rightly judged to be adequate for an engine of the power of the Swift, and has the advantage of obviating the slight complication of a pump. The clutch is a leather-faced cone, with springs beneath the leather to ensure a sweet engagement. Suspension throughout is by semi-elliptic springs which are noteworthy for their considerable length and the slightness of their

We are glad to note that the gearbox provides four forward speeds a necessity, in our opinion, on a car of moderate power.

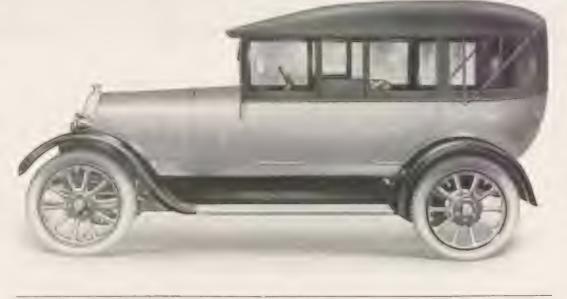
In addition, the "scuttle" has been raised to impart a more graceful streamline effect, while more space than hitherto is provided in the four-seater body, both as to seating and leg-room. Another alteration which improves the appearance of the "Twelve" is the setting of the instrument board at a slight angle, while a double windscreen replaces the single screen of last year.

Enlarged ventilators have been

fitted on each side of the scuttle, and a larger tool box is fitted at the rear, upon which the registration numbers may be painted.

The 10 h.p. standard bodywork was re-designed in the early autumn, and the only notable change for 1922 is that the side curtains which open with the door are fitted. The upholstering throughout including that of the dickey seat is in leather.

One example of the "Ten" two-seater and four of the 12 h.p. model, including a bare chassis, will constitute the Swift display at Olympia.



The All-Weather Swift Twelve as a limousine, a cabriolet, or an interior saloon—with whichever type one likens it the "top" provides equally efficient protection. And its simplicity of operation is its charm.

sunk in the crank case and surrounded by the lubricating oil, and they say that not only does it require very little more oil than usual for cooling as well as lubrication, but that the engine is as quiet as an ordinary water-cooled four.'

" I'm afraid I can't appreciate all these technical points Windie. I'm all for simplicity, anyway, in speech as well as motor cars.

"Look here, old thing, you can't put that sort of stuff over on me. You are as capable of looking after a car as I am and quite capable of conversing intelligently about it."

"Spare my blushes—but I believe you're hinting that I talk too much?"

"Oh, never let it be said! But joking apart, I recommend these two-cylinder buses to your notice."

"Right oh! And perhaps sometime you'll take me for a little trip in your Rolls runabout?"

"Dry up, and don't be silly!" And with similar amenities they continued their perambulation.

"How about the Ashton-Evans, Windie? There it is in the next aisle. I seem to have heard a lot about that. They say it's a jolly nice little car, and fast, too.

"Yes, I believe it is the goods all right. Looks nice, doesn't she? Horse power 10.8—only £11 tax then. A quid saved is a quid earned; you can tell the Governor that I am mending my ways to the extent of appreciating the practice of economy!"

"By other people? Yes, I will. There's the Bugatti, Windie. That ought to suit you, didn't

"Yes, it's fast enough, goodness knows. But the price is rather on the high side, or so the pater would say. However, what's a hundred when he's spending thousands?"

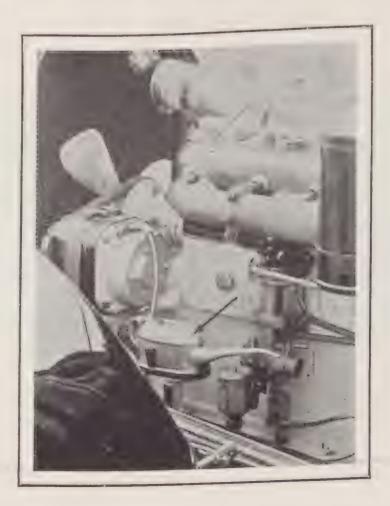
So much for your appreciation of economy! Oh, Windie, and they accuse women of being inconsistent!"

"I was only joking, my dear," replied Wyndham, complacently.

'Look here, I know the very car for you—the Lagonda, with a really nice coupé body which can be made just as open as any



Tools most likely to be required in the course of a run are arranged beneath the bonnet on Humber cars. The arrows in the upper picture indicate the jack and the two portions of its handle. Below, the position of the oilean is shown.



ordinary two-seater touring car —there she is.'

"Yes, that's not bad at all. But how is she for speed?"

"Well, the standard car is as fast as you'll ever want, I expect, but they have put up some remarkable performances at Brooklands, you know.'

"Talking about 'standard' cars, there is the Standard, Windie. D'you know, I don't believe I need look any farther for I know its running well, and the two-seater is as weatherproof as one could wish.'

" I know the Standard is good; but do let me advise you not to decide in a hurry, Ethel."

"P'raps you're right—but really there are such a lot of good things that it is all rather confusing. I'd be happy with a Calcott, Standard; Morris. Lagonda-oh, in fact, with any of them! But then we haven't seen the Alvis yet. I must see that-and here's the Humber, Windie. Look at that nice little all-weather, two-seater on the 11'4 h.p. chassis. That's the very thing, you know!"

"It is; but again, don't get too enthusiastic until you've seen the lot. By the way, don't forget the White City, either."

'But there aren't many there, are there?'

"Sure there are-good 'uns, too. But our half-hour's nearly up. Oh, just look at that little Bianchi! You would be all right with that, I know."

"Yes, it's as pretty a car as I've seen, and the 'works' are sure to be sound. I was reading something in The Motor-Owner not long ago about the wonderful care they take in the factory. What about the Albert though, Windie. Do you know it at all?"

"I've been for two or three runs in a four-seater. It was great, and incidentally they've got some wonderful new allweather bodywork that would make it just the car for you. We'll tour round and find it. In the meantime I most distinctly like the cut of this Enfield-Allday.'

"Oh, I really do think I'll

have that one!'

"Now, cut it out, kiddie-WAIT, bother you! Look here, I've dallied with your wants (Continued on page 54.)

THE 200-MILES LIGHT CAR RACE.

Some Impressions of a Great Contest and a Great Triumph.

THE Talbot-Darracq team scored a remarkable success in the great international 200miles race at Brooklands on October 22nd. From the first moment the three cars, driven by Major H. O.D. Segrave, Captain Malcolm Campbell, and Mr. Kenelm Lee Guinness, led; there was a change during the race in the relative position of the three, but they retained the first three places throughout. Eventually Major Segrave (No. 33) was returned as the winner, in 2 hours 16 minutes 26 seconds, at an average speed of more than 88 miles an hour. There was a difference of only five seconds between first and second-Mr. Lee Guinness, on No. 65, and of two seconds more than four minutes between first and third-Captain Malcolm Campbell, on

It can be seen, therefore, that while this was the longest race that has ever been held on the Brooklands track, it provided also one of the closest finishes that has ever been

seen—and there was no handicapping. How close was the running of the three cars can be judged from the fact that for twenty odd laps, although Major Segrave maintained his original lead, Captain Campbell was running well for second place. Then he stopped at the pits—he was the only one of the three who required to do so--and in 28 seconds (by a rough "clocking") he had changed both rear tyres and was away again. But the necessary slowing down and speeding up had cost him more than the 28 seconds of the actual halt—more, indeed, than his lead at 18 laps of 1 minute 59 seconds from Lee Guinness. And thence onwards he took, and kept, third place.

The race was obviously a triumph for the Talbot-Darracqs, but the regularity of their running is even more interesting, and even more important, than the mere win of the team. It proved not only that the Talbot-Darracq was the fastest of the makes of cars entered, but that,

apparently, the makers can turn out any number of cars of the same type and guarantee almost absolute uniformity of performance.

The result does not necessarily prove, though, that Major Segrave's car was the fastest of the three. It must be remembered that in such a race a team win counts for very much more than an individual success.

The weather was the one uncertain factor—although, as matters turned out, this could not have spoiled the gate. It had been fine up to the start, but during the first few laps a nasty drizzle began, accompanied by a high wind. Before we had finished pitying the drivers, however, the rain ceased, and for the rest of the day—or rather, for the rest of the only two-and-a-half hours that really mattered—the sun shone, and the drivers had everything in their favour.

There was but one accident of any consequence—which surprised many people. Never before have nearly fifty cars endeavoured to use the track



Major H. O. D. Segrave (Talbot-Darracq, No. 33), who won in 2 h. 16 m. 26 secs.



Mr. K. Lee-Guinness (Talbot-Darracq, No. 65), who was second in 2 h. 16 m. 31\frac{4}{5} secs.



Captain Malcolm Campbell (Talbot-Darracq, No. 50), who was third in 2 h. 20 m. 28 secs.

MANY REMARKABLE PERFORMANCES.

at high speed at the same time. The start was feared. It was thought that the big bunch of cars all getting away together from the Fork would more or less maintain their relative positions until the banking behind the Members' Hill was reached, when those on the outside would be forced, willy nilly, up the banking. It was then doubtful whether their horse-power, and consequently their speed, would suffice to hold them sideways on the steep gradient; and, in the event of a wet track, many people had visions of the topmost car sliding down upon those below and causing a very nasty situation. But no such thing happened. Contrary to expectations, although the cars started in batches of about thirteen, they had long lost their formation, and were running individually when the banking was reached, with the result that in most cases they were able to take up their natural position on its slopes.

Of the first row—the 1,100 c.c. cars—for instance, Captain Nash on his G.N. drew right out from the crowd at once, closely followed by Lombard's Salmson, Phillips's Deemster, and the Bleriot Whippet. And that reminds us that we have as yet said nothing about Captain Nash's praiseworthy victory. He got away first at the outset, but before two laps were done, No. 6, Ware's Morgan, drew ahead. At eighteen laps the Morgan was leading by about three minutes, but Nash plugged steadily on, and at

lap number 20 the Morgan retired. The G.N. had then nothing between itself and victory—and it won, at nearly 71½ miles an hour! Second and third were respectively Mr. Lombard's Salmson, and Mr. Phillips's Deemster.

The Salmson, of course, was unlucky in wasting about a quarter of an hour in replacing collapsed wheels; on the other hand, we are told that the G. N. was never "all out." It would be interesting to see an absolutely straight race between these two cars. Our opinion is that the finish would be mighty close.

In neither race were there many exciting incidents. The nearest approach was the running of the Charron-Laycock, No. 29, which was obviously missing—apparently quite badly. As it came round time after time, still spitting and banging, we got curious. We "clocked" it—roughly, of course. The reading was 83 miles an hour, in spite of its "missing." We thought it had a chance, especially if the missing could be cured. But it retired in the seventeenth round.

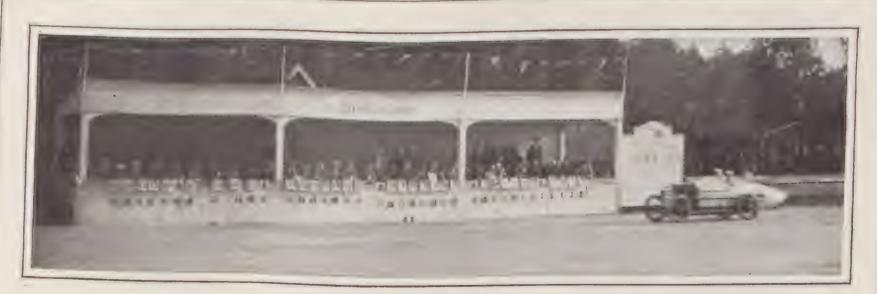
Much the same applies to Ashton-Martin No. 60, driven by Mr. H. Kensington Moir—with whom, by the way, we used to do some astonishing acceleration stunts on the sixcylinder Straker-Squire. His car was running beautifully so far as the spectator could tell. It was one of the most silent of all, which rather suggested comparative slowness—a misapprehension which was corrected

by our 'clock.' We thought he had a chance, also—always supposing that the Talbot-Darracqs were unable to maintain their regularity—but Kensington Moir retired in the forty-seventh lap.

The A.C. team was unfortunate. Much was expected of the five cars, but they proved a disappointment. On the other hand, the Bugattis provided a note of interest. For a long time No. 31 was running on its own, and its tremendous "revs." and high exhaust-note came round regularly at about a 90-miles-an-hour Later it was joined by the pace. second Bugatti, and these, the Horstmann which was fourth and another car, the name of which we have forgotten, continued to run together. The combined din of the four was deafening. Mr. Bedford's Hillman, which came in 6th, also put up a fine performance. It is interesting to note that the winning Talbot-Darracq used Rudge-Whitworth wheels and Pirelli tyres, K.L.G. plugs, Delco ignition, Solex carburetters, Shell spirit and pure castor oil. Palmer tyres were fitted to the G.N

The success of this first race leads one to hope—and we believe not without a considerable chance that the hope will be fulfilled—that it will be but one of a series, perhaps annual, perhaps more frequent.

An interesting announcement is made on page 26 of this number. Don't miss it!



A fine picture of a fine finish. The actual line extends from the two black marks on the base of the grand stand into the bottom right-hand corner of the photograph. The lap scorer in the stand has his hand extended to tear the 72nd sheet.

for a good while. Now you've just got to come and look at the new 10 h.p. Talbot with me. I've an idea that I can cast anchor there."

"Would that be any good for me?"

"I don't see why not. We know it is fast enough for what I want, but the makers wouldn't turn out only a

speed iron, anyway.'

"No, I suppose not. But look, here's the Swift—why, the side curtains open with the door, same as the Standard, Humber and Albert. Quite a nice little bus—is that sufficiently unenthusiastic?"

"Too much so, really, for this all-weather body is a bit out of the ordinary—see, the side curtains can be used even when the hood is down, and the way that curtain is fixed up as a screen for the people in the back is quite good. You musn't forget the Swift when it comes to making a choice."

"I rather dread that final selection, Windie. It's rather like the 'happy with either, were t'other dear charmer away' business. But we're late—and there's father, not looking too pleased!"

"You look a trifle 'peeved,' Pater," said Wyndham, taking the bull by the horns somewhat untactfully.

"If by that you mean displeased, you are right. You have kept us waiting for nearly a quarter of an hour,

and I dislike unpunctuality, as you know full well."

"Having got which off his chest, our noble progenitor proceeds to account to us for his movements during the past thirty—no, forty-five—minutes. How

did you get on, Father?"

"Well, we have seen some magnificent vehicles, my boy, but I must confess that I have not the faintest idea of which cars would be most suitable for our various purposes. How have you youngsters fared?"

"Fair to middlin'—only Ethel is such an enthusiastic little idiot that

she wants one of each.'

"I rather sympathise with her. There was a splendid Rolls-Royce touring car down in the coachwork section—on Arnold's stand I think it was —which I felt was positively the car we must have. And then, a little later, we came to the Daimler exhibit. The Thirty, don't they call it? seemed ideal —and, to cut a long story short, I do not see how anyone could wish for anything more comfortable than the Wolseley Twenty, the Napier, the Lanchester, the big Crossley, the six cylinder Sunbeam, the Leyland Eight, or-oh, that is all the names I can remember, but there were many others all of which seemed to me to be equally

"You are about right there, Dad, and your experience is very much the same as ours. As a matter of fact

almost any of the cars you named and saw, and almost any of those that Ethel and I saw, would be suitable—and I really ought to have warned you all that you would be very unlikely to be able to make a choice to-day—certainly not in your first stroll round."

"Do you mean that we shall have to

come again?"

"Not necessarily, but I think it would be wise to go round with me again, collect catalogues of the cars that take our fancy, and talk things over quietly at home. We can then make our decisions in comfort, and you can either come here again or delegate me to do the business. I could spend a week here!"

"Ah, my lad, I am afraid I am past

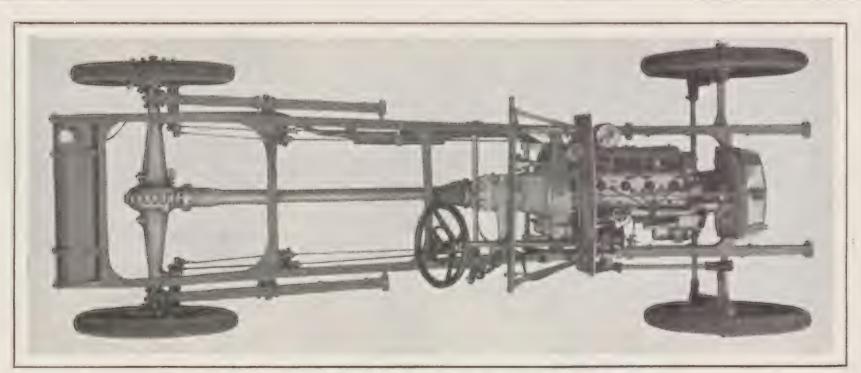
the enthusiasms of youth!"

"So am I, Dad, compared with Ethel! But come along, people, let's look at the big stuff! Shall we make for the Daimler stand first and radiate from it?"

"Lead on, my boy, we are more or

less in your hands.

"Well, we musn't forget that we want a couple of medium-powered landaulets or coupés as well as the big touring car. I should suggest that mother's car should be of about 20 h.p.—such as the new Daimler Twenty, for instance—since it will be taking the family to the theatre and so on, while probably a 15'9 h.p. chassis with a two-seater coupé body, like the Humber,



The chassis of the new Vauxhall light car, showing the clean lay-out of the transmission system. Detail photographs of the engine are given on page 59.

OUR MASCOT



The Motor Owner Mascol

The above plate reproduced in photogravure, plate sunk, size 16" × 13", will be on sale at "THE MOTOR-OWNER" STAND No. 223, at the Motor Show, Olympia, price 2/6, or direct from the publisher, 10 HENRIETTA ST., COVENT GARDEN, LONDON, W.C.2, securely packed and post free, 3/-

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SEE THEM - HANDLE THEM - TEST THEM - ORDER THEM

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page

would suit you down to the ground, Dad."

"Yes, two seats will do for me, because-don't laugh, sir! -I mean to learn to drive myself."

"Bitten by the speed bug already, Dad?"

"Don't be frivolous—is it likely that at my age I should become enamoured of a new pastime?

"It's a matter of fact, Governor, I should say it is most likely. However, we will say that you want to keep the wages bill down, and let it go at that."

"Have it your own way, Wyndham. Perhaps, as I have driven my own animals so long, I do not altogether care to feel

dependent upon someone else's methods at the wheel. Besides, I believe that an employer of labour should be thoroughly conversant with the duties imposed upon his em-

ployées."

"Well said, Dad! The 15'9 h.p. Humber coupé, then, is the type of car we have to seek for you. Mother should be well served by a 20 h.p. Daimler landaulet—but we must leave her to choose her own coachwork, colour and interior fittings, while something between thirty and fifty horsepower, with umpteen cylinders, has to be decided upon for the family bus."

"There is one point that occurs to me, Wyndham. Would it not be better to choose as many of our cars

as possible from one make?"

In the ordinary course of things, yes, Father, but since the war manufacturers have rather tended to spec-

ialise on one model, so that your idea is not altogether possible. This year I notice that quite a number of firms have added models to their list, and have again quite a range. Daimlers, for instance, have a 20, two types of 30 and a 45 h.p. chassis. And Wolseleys have an 8 h.p. two cylinder, 10 h.p. and 15 h.p. four cylinder, and 20 h.p. six-cylinder models."

"There you are, then—an 8 h.p. for Ethel, and a ten for you; the 15 for me, and the 20 for your Mother. That leaves only the two touring cars and the van!

"That's certainly an easy way of settling it, Dad, but the Wolseley Ten is a trifle smaller than I was thinking of,



Two separate rear screens are fitted on the 15.9-h.p. Humber.

although it would be the very thing

"You are making confusion doubly confounded, Wyndham. I really don't see how we can come to a decision. Perhaps, however, a little variety in our stud may be more interesting than complete uniformity."

"Yes, I think so, Dad. And as a

for Ethel. And perhaps you are right about the two larger models. Anyway, we are not deciding now; and I'd like to point out that, whether patriotically or accidentally, we have almost entirely limited our consideration to British cars so far, whereas there are some remarkably good foreign vehicles —American, French, Spanish and Belgian—and, incidentally, German. Also, there is still the White City exhibition to visit. You must see the Packard twin-six—twelve cylinders, you know-and the Paige cars there.

matter of fact, although I have not



A folding and disappearing occasional seat on the Lanchester.

been looking at the mediumsized touring cars very much, it struck me that it would be quite a good idea to invest in an American make, such as the Essex, Buick, or even the Paige, although that is a little large for that particular purpose. On the other hand there is the 16 h.p. Talbot and the Sunbeam of the same power, the 16 h.p. Talbot-Darracq, the Ruston-Hornsby, and a whole heap of others that would be exactly right."

"Well, look here, my son, it seems to me that there is but one way out of the difficulty. You shall take me for a personally conducted tour of both exhibitions, and I shall be very interested, if very

confused, to hear all that you have to Then this evening, when I hope that you, at least, will have succeeded in co-ordinating your impressions, we will go into matters more definitely. I shall leave the selection to you, and have little to say except in the matter of price.'

'That being so, Dad," said Wyndham, "let's begin to take an interest in our surroundings. And, bearing in mind what I have been saying about the possibility of having an American make of light tourer, what's the matter with the Hupmobile there, on Whiting's stand?'

"It has quite a good appearance, but what is the power and price?

"Sixteen-point-nine, I believe; £17 tax. The price is £595 just as she stands."

"Well, if you like the car, make a note of it—but what is that neat little car here on Stand No. 244?'

"That is the new Beardmore Eleven, with overhead valves and a thoroughly up-to-date general make-up. Nice little bus, I should say. Here's another American, by the way -the Buick."

"Oh, yes, I heard them talking in the Club about the new Buick four,' but I am bound to say I did not understand much of what I heard. The general concensus of opinion, however, appeared to be that it is good.

"It is; sure to be. And it is just about what we require. Another note! Ethel, how about a Deemster for you? You know the car already and like her, don't you?'

SPELLBOUND BEFORE MAGNIFICENCE.

"Yes and, look, they have got a little bigger model this year, too! I'll have to think about that—and the new Singer, too, with the gear-box in its proper place!"

"What do you know about the proper place for a gear-box? Still, I agree with you in not liking too much unsprung weight. By the way, look at that new six-cylinder model."

"It ought to be nice. I say Daddy, we're coming to what Windie calls the big stuff now. Look—Delage, Straker-Squire, Armstrong Siddeley, Minerva; they all make lovely big touring cars."

"Yes, and there's a new 15-h.p. Straker, Ethel; you remember the pre-war Fifteen?"

"Rather; it was one of the best, although I didn't get so much chance of motoring in my schooldays. By the way, Mother, are you at a loss for words? I've never heard you keep quiet for so long!"

"Don't be cheeky, dear. As a matter of fact I am taking it all in; at the moment I was admiring that Armstrong Siddeley carriage—one of the two supplied to the Duke of York."

"Oh we do love a title, and especially a Royal one, don't we? But Mother is quite right, Ethel, it is a lovely car.

I am afraid the chassis is a little on the large side, though, for her landaulet."

"Ha, my boy, and that is where I can put you right," remarked the squire in a fine humour with his unexpected score. "I happen to know that there is a new Armstrong Siddeley six-cylinder model of 18 h.p. Let us go across to the stand and see it—yes, there, you see, both a saloon and a touring car of that model. I suppose we could buy a chassis and get Maythorn's or the Grosvenor Carriage Co. or someone to make a landaulet body for it?"

"Sure, pater; down she goes in my note-book. And you may as well look at the De Dions while we are here. They've got about four models with four- and eight-cylinder engines, and even you (I must get a bit of my own back!) know the reputation of the make.

"Well, I am leaving all that to you, Wyndham. By the way, would not a Delage make an admirable family touring car—since you insist upon my spending a couple of thousand pounds or so on that vehicle?"

"It certainly would, Dad, but I don't insist; I merely ask you to consider what is due to the family and to your position in The County."

"Er, yes, yes; quite so. Then the Delage is noted for further consideration?"

"Yes, but it's going to be a long list, Dad. We are all as bad as Ethel—want everything we see. Except Mother—look, she is spellbound by that superb Minerva! You like that, don't you, Mother?"

"I think it would do nicely, Wyndham, but I am almost afraid to inquire

the price."

"No more than anything else of the same class, Mother. The question is whether we want a luxurious saloon like that, and I must leave that to you and Father to discuss. Excuse me, Ethel's beckoning frantically down the aisle there."

"Windie, why didn't you say that the Vauxhall people were making a small model—a 12?"

small model—a 12?"
"My dear girl, I didn't know it.
And don't you get excited, anyway;
it's too big for what you want."

"Yes, but the family fifteen? It's

just the thing for that.

"So it is; but I'm not getting much chance to look for my sporting model—"

"Nor am I for my pram! Oh, well, I suppose we must be patient. This is the parents' day out! How



The II'4-h.p. Humber engine and some of the transmission and control details. The throttle control by means of a small ratchet arrangement is ingenious.

ALL SORTS OF COOLING.

about the Arrol Johnston for one of our various purposes? There's the

stand, behind you."

"It's a neat job, chassis and coachwork, isn't it? Worth noting, anyway. Hi, Ethel! keep the old folks happy for a minute while I have a look at that Hillman. To emulate you in quoting The Motor Owner, they say it is very much 'the goods.'"

"What have you done with Wyndham, Ethel?" her father asked the girl as she found her parents lost in admiration at the Crossley stand.

"Oh, he's positively drivelling over the sports Hillman, Daddie. I say, I wish you hadn't all of you decided that the car for me is a cross between a high chair and a motor-scooter! Just look at that absolutely delicious 19'6 Crossley. I could spend my days and nights in it."

"Yes, my dear," rejoined the squire. Your Mother and I had just decided that the 25-h.p. landaulet and the 19'6-h.p. chassis with a coupé body would be ideal for our own personal cars. We must tell Wyndham to note

them down."

"Then I must be content with something smaller," Ethel remarked petulantly. But the clouds soon passed from her usually cheerful little face, and she stopped as enthusiastically as ever to admire the small Talbot-Darracq models, where Wyndham rejoined the party.

"I say, Pater," he remarked, "just cast your optics on the T-D Eight. That's the family bus all ready-made."

"What, may I ask, is the T.-D. Eight? Be a little more explicit,

please."

"The eight-cylinder Talbot-Darracq; and, talking about 'eights,' here's the Cadillac next door—the car which introduced a complete electrical equipment for lighting and starting to this country."

"And very nice, too—both of 'em," Ethel interjected. "The price of the Cadillac used to be amazingly low, I

remember.

"Well, it's a bit thicker now, of course, but you can't call twelve-fifty expensive for a car of that character."

"It depends what the car is to be used for, Wyndham," remarked his father. "If it is what you call the 'family bus,' well and good, but you two children need not think that I can afford over a thousand pounds for four wheels for your use."

"Bottle it, Dad; there's no need for excitement. I know exactly the type of car I want, and £500 or so will

cover it."

"Humph, so I should think! In the meantime, here is the six-cylinder Sunbeam which so impressed me a while ago. What do you think of it, Mother?"

"Remarkably graceful lines, for an

open touring car. They are usually

so ugly."

"Yes, and, Daddie," said Ethel, "they have practically redesigned their engine. It was just lovely to drive before, so what it must be now I can't think."

"Hullo, this is the girl who admired simplicity of speech just now! Who's being technical now?" asked Wynd-

ham.

"You don't call that technical, surely? I do know a bit about it,

you know."

"Now, children, stop bickering. Yes, I know it is only fun, but I want you to come and give me your expert opinions on this Rover," said their mother. "I like the carriage work, only I am afraid that it might be a little small for our purpose."

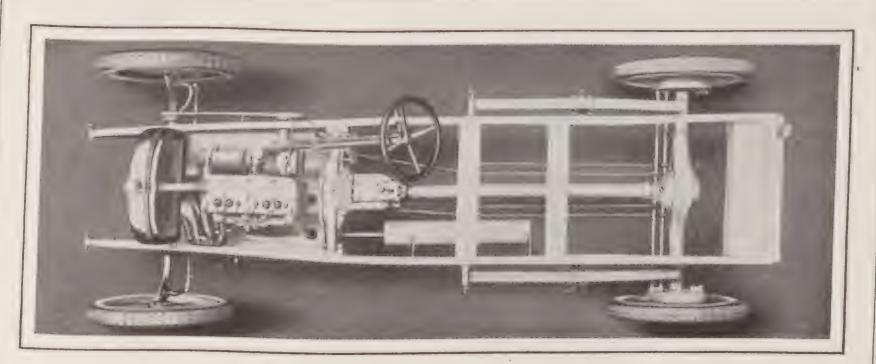
"I shouldn't say so, Mother; the chassis is big and strong and powerful enough, and bodywork is a matter of selection. Anyway, I'll add the Rover to the list. How about the

eight,' Ethel?"

"I can't help liking the little beggar, Windie, but I also can't help wondering why I should have two air-cooled

cylinders, while you---."

"Yes, you said that before, you spoilt kid," interrupted Wyndham. "Who wants you to have two cylinders or air-cooling? Temper-cooling is the thing for you! All right, I won't put it down."



The chassis of the latest 20-h.p. Berliet, showing the light yet rigid design of the rear axle and torque tube.



SOME NOTABLE ACCESSORIES

While most cars are sold ready for the road, the most complete equipment usually requires additions by the individual owner. There is no time like the Motor Show to make



The Atlas Safety petrol filler has several individual points to recommend it. Notably the can remains air-tight until the nozzle is inserted in the tank, when the weight of the can automatically opens the outlet. The filler includes an efficient filter.





The question of gloves for winter driving is a difficult one to solve. Many people dislike the ordinary mitt type. But the Dunhill glove, shown above, is not ordinary.

On the left is shown a handy Brooks combined thermos flask and sandwich case—just the thing to take on a winter run. It is generally retorun a car of and there are such that which wet and difficultivated. dens and call



ATTHE MOTOR SHOWS.

proper selection of accessories, and we anticipate that some most interesting novelties will be shown this year. In the meantime we illustrate a few that will be found useful.



in sh nowadays are exposed, the leaves from thoroughly is Rams-White City.

11-



As will be seen there are two flaps through which a single finger or the whole hand may be protruded. The price ranges from 1.4s. per pair. They are worth inspecting at Dunhill's stand at Olympia.

On the right is shown the latest pattern mileometer, the price of which has been reduced from £88s. to the moderate figure of £5 5s.

4



An electric horn of some kind is to be found on almost every car nowadays, and in spite of their comparatively delicate mechanism they seldom give trouble. The example illustrated is a "Graham" which has a note at once penetrating and pleasing.



process of exed gap piece is new down to the autenthen be



"Oh, please do! I'm sorry, Windie; I know it's silly, but I was half joking, anyway. And I do like the little Rover. It is wonderful value, an' all that.'

"All right, dry up. Let's take the family to the Lanchester stand and show them another ideal big touring

"We will look again, if you like, Wyndham," said the Squire. "But your Mother and I spent some considerable time there earlier, and I am already convinced that the car would do admirably.'

"Right oh! Dad. How about this Talbot for our

fifteen, then?"

"You can recommend the car, I suppose? But there, I should be almost safe in doing so myself, for I seem to have been hearing about the excellence of Talbots for many

"I'll note it down, then. And these two Ruston-Hornsby models are worth considering, too. I don't know a great deal about them, but I have heard several fellows say it's a fine job."

"Here's the Wolseley stand again, Father. Do you want to stop?" remarked Ethel.

"I don't think so, my dear. I feel strongly that we could obtain nearly all, if not quite

all, the vehicles we require here, but Wyndham doesn't quite agree. However, we can fight that out later on. I almost fancy he has something up his sleeve—the car he fancies is more expensive than he dares mention, and he is hoping to cut expenses on the other cars, perhaps?"

'No, honestly, Dad, it isn't that. But the Wolseley Fifteen with a sporting two-seater body is what I want, not the Ten, and I know you won't run to it. Give Ethel the Ten and Mother and yourself the Fifteen,



The tool-box fitted on the running board of Lanchester cars.

with appropriate bodywork if you like I know you would be satisfied.

"Very well, we will go into that later on. Oh, by the way, I forgot to mention it at the time; you were admiring the Hillman, I fancy. But what is your opinion of the Overland?'

"For our light touring car? Well, Dad, if we are thinking of buying an American car at all, we ought to include it in our list. Here's some more big stuff. Just look around. British Ensign—that's a beauty, I

believe; Sheffield-Simplex—no need to say anything; even you know it, don't you, Dad? Leyland Eight-made 'regardless' and was to have been (still is, for all I know) the most expensive car in the world. I expect the Elizalde they had in Paris beats it for price, though. And the Lancia. Pity they scrapped their twelvecylinder, but I suppose from a commercial point of view they were wise; although the Fiat people think a 'twelve' worth while, and a wonderful job it is. Did you notice it, Dad?"

"Yes, my boy, but I think it is rather larger, and, incidentally, more expensive than we require or can afford.'

"P'raps so. Well, now people, I think we can decently





A hinged boot scraper which can be dropped to form a lower step for tight-skirted ladies is an interesting feature of the latest Lanchester.

A SAUCY SIMILE.

leave this abode of bliss and transfer our presence per motor coach-first time you've been on one, isn't it?—
to the White City."

"Well, Pater, what do you think of motor coaches? Do we draw a kindly veil over the proceedings, or is it not qute so bad as you thought?"

"Not quite so bad; very much more convenient, at any rate their finding one's own way from Olympia to the White City And now we are

here, what are we to see?"
"Well, it's such a great, rambling place, as I remember it from last year, that I think we had better take the stands in numerical order, and not be led astray on side issues. First of all, Ethel and I want to see the Carrow car, on Stand No. 45. It will be through here, I fancy."

"Yes, Windie, I do want to see the Carrow; it has about the nicest lines of any light car except the A.C., perhaps. There you are—now don't you think so, too?"

"It certainly is pretty, and I believe that the design is as good as the appearance. You have a look while the rest of us study the Magnetic car along here."

"No, I want to see that too -transmission by magnetic attraction instead of gears, isn't

"Yes, and variable "gear ratios" by varying the attraction, as you call it. The greater the attraction the faster you go! Sounds like love's young dream, doesn't it?"

'Don't you think—talking about unconventional transmission systems —that the G.W.K., over there, might

do for me?"

"No reason at all why it shouldn't —jolly simple car to drive; even you couldn't mess it up! No, I'm only

A grease gun is part of the Lanchester tool equipment.

joking," dodging a fairly hefty "left." 'And they've got a new, still simpler model, more like the original G.W.K., which is interesting at any rate.'

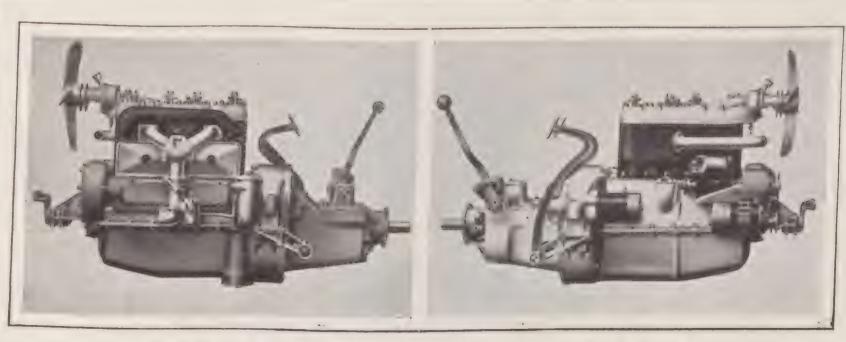
"Dad," Wyndham continued, turning to his father, "there's the G.N. It is not provided for in my estimates, but I honestly think one of the new type, with a detachable box body, would be jolly useful about the place. In fact," he added, "we could almost cut out the van if we had one of them. The G.N. would be ever so much cheaper."

"Make a note of it. But where's this wonderful Packard? Ah, there it is, on Stand No. 56. Come along."

"I am glad you remembered it, Father, for I had overlooked the Packard in my White City list, and that would never do. I have heard some astonishing reports of its performances - scarcely believe 'em, in fact; but as everyone who has tried the car is agreed, I suppose it must be an extraordinary bus. I'll put it down in my little old note-book. Now come back to the straight and narrow path of our tour. The Argyll is next-I suggest it to your notice in the mediumpowered family class.'

"What's a medium-powered family, Windie?" asked Ethel.

"Don't be frivolous; you



Two views of the engine of the light Vauxhall chassis. It will be noted that clutch and gear-box housings are bolted up to the crankcase to make a single unit.



know perfectly well what I mean. Look here, my child—here's the Ballot—the car which has done such wonders in French racing. I think I might like that for mine own. And how about a Jowett for you? Another nice, simple little car."

"It wouldn't be bad. Oh, there's the Charron-Laycock—now, that is just what I want. Two-seater with a nice big dickie; electric starter—quite a lady's car!"

"Puzzle: find the lady—what?"
"Don't be rude—you know the little

bus is good, anyway.'

"Sure; and there's the Carden in close juxtaposition, go to speak, with the H.E. If a touring H.E. is a 'he,' is a sporting H.E. a 'she'?"

"You can search me. But that's another car that I have heard spoken well of. It isn't very well known, is

it?"

"Oh, I don't know. They broke a lot of records at Brooklands recently, and it is always regarded as among the few best of its type. The same thing might be said of the Alvis there, too. Highly efficient (H.E., you know!) and highly refined, also, both of them."

"I suppose you want us to think that's original humour, don't you? Because I happen to know it isn't. By the way, Windie, what's the matter with the Cubitt for our

'fifteen'?'

"Nothing—it's wonderful value for money. But it is at Olympia; we missed it somehow. Fact of the

matter is, old girl, that you and I will have to come down again to-morrow. There's a whole heap of cars I want to really spend some time over, and we haven't even seen them—the Cubitt is one. Then I want to see the new Ioh.p. Voisin and the small Panhard, the Peugeots, and especially Le Zèbre. I noticed the Zebra on Whiting's stand when we were admiring the Hupmobile, but forgot to look more closely."

more closely."

"There's the Vulcan, too, that we haven't seen. I'm told that it's very much improved this year, although it was always an awfully well-finished_car."

"Yes, I've heard the same. They were never great ones to shout about their wares, but the Vulcan has always been known as a reliable, high-class car. And then I wanted to see the Maxwell and Chalmers cars—haven't come across 'em yet—also Angus Sanderson. There's a remarkable proposition, if you like!'

"Enormous number of them on

the road, anyway.'

"Sure; and what better evidence of their quality can one want?"

"I know one make you've forgotten, Windie—the Austin. They are not at the Show, are they?"

"I don't think so, but I read somewhere that they are holding a special display at their Oxford Street showrooms. We must take the parents there, for I've a very good idea that a 20 h.p. landaulet, and a 12 h.p. coupé for the Pater would just about fill the bill."

"That is a good idea, but it's a toss-up between Wolseleys and Austins—you know how struck he was by the Wolseleys at Olympia?"

"Yes, I know. Well, that's only one of the knotty problems to be settled at the family pow-wow later on."

"I wouldn't mind a two-seater Austin twelve myself, Windie. What

do you think?

"I think if you want it, you'll probably cajole the Guv into letting you have it! I know you, my love—suaviter in modo gets there every time with you!"

"Well, I like that! What about your first-born-son-and-heir stunt?

You've had enough fatted calves killed to feed a regiment!"

"Hush, I'm not a cannibal! Still, 'nough said. We each have our methods. S'long as we do get there, what does it matter how?"

"Right oh! Book a 12 Austin two-seater coupé or all-weather body

for me, please.'

They turned to find that their parents had been strolling on while they were chatting, and hurriedly rejoined them, both ready with a complete set of apologies to fit all needs. There was no necessity to draw upon their fertile imaginations, however, for their father greeted them with:

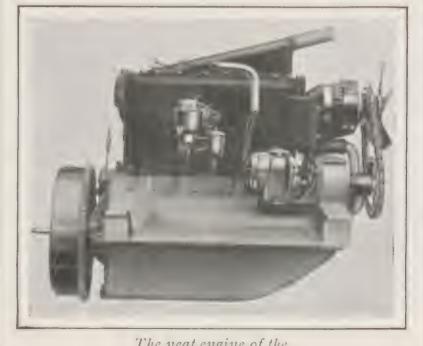
"Wyndham, your mother wants to be shown the Hispano-Suiza," remarked the Squire. "Probably because the King of Spain uses them. That also is a very wonderful car, is it not?"

"Well, it created quite a what-d'ye-call-it?—a furore; thank you, Ethel—last year, but I don't seem to have heard so much of it just lately. I believe they also are introducing a smaller model—or is it the Delage people? I'm hanged if I can remember. However, there it is. Did you notice the Mors on Malcolm Campbell's stand back there? It's a beauty. How do you like it, Mother?"

"My dear boy, I made up my mind when we first set out to-day to leave all the opinions to you men-folk. It did not occur to me that Ethel would

> insist upon being taken so much notice of. And now, if you don't mind, I think I have had enough sightseeing for one day. Let us find our car and go home."

> "Very well, Mother. In any case, I think that out of all we have seen we can make a very good selection. There are one or two points to be considered—but you'll all feel more like going finally into matters after dinner. And, incidentally, I am afraid we shall not be able to settle matters out of hand, for Ethel and I have come to the conclusion that we simply must pay another visit to both shows. We are both fairly decided as to what we want, but there are quite a number of other cars to see before we can say much about the other vehicles.'



The neat engine of the 19.6-h.p. Crossley.

THE SUPREME

SUNBEAM

MODELS FOR 1922

GREATER POWER AND EFFICIENCY

REDUCED PRICES

The Sunbeam Motor Car Co. Ltd. have pleasure in stating that in their next Season's models they are standardising overhead valve engines of high efficiency, in addition to which the prices of their chassis and complete cars are reduced in accordance with the list below. It will be noticed that this list includes a smaller model—the new 14 h.p.—now introduced for the first time, and incorporating some very interesting features.

LIST OF MODELS AND PRICES

STAND
281
OLYMPIA

					-
14 h.p. chassis -	_	_	-		£575
	en.	-	-	-	£725
14 h.p. 2 seater -	_	-	-	-	£725
	_	_	-		1,750
16/40 h.p. 5-seater to		_	**	-	1,960
16/40 h.p. 4-seater lig			-	***	£960
16/40 h.p. Limousine			-	-	£1,300
24 60 h.p. chassis (for			-	_	£1,025
24/60 h.p. chassis, lon	o wheel l	use (for	closed o	ars)	1,0,00
24/60 h.p. 5-seater to	uring car	_		-	1,1,295
24/60 h.p. 4-seater lig			_	-	£1,295
24/60 h.p. Limousine			-	~	£1,625
24/60 h.p. Saloon		-	-	-	£1,650
1/					

STAND
281
OLYMPIA

A selection of these models may be seen at our Stand, whilst a larger range is always on view at our London Showrooms, 12 Princes Street, Hanover Square, W.1

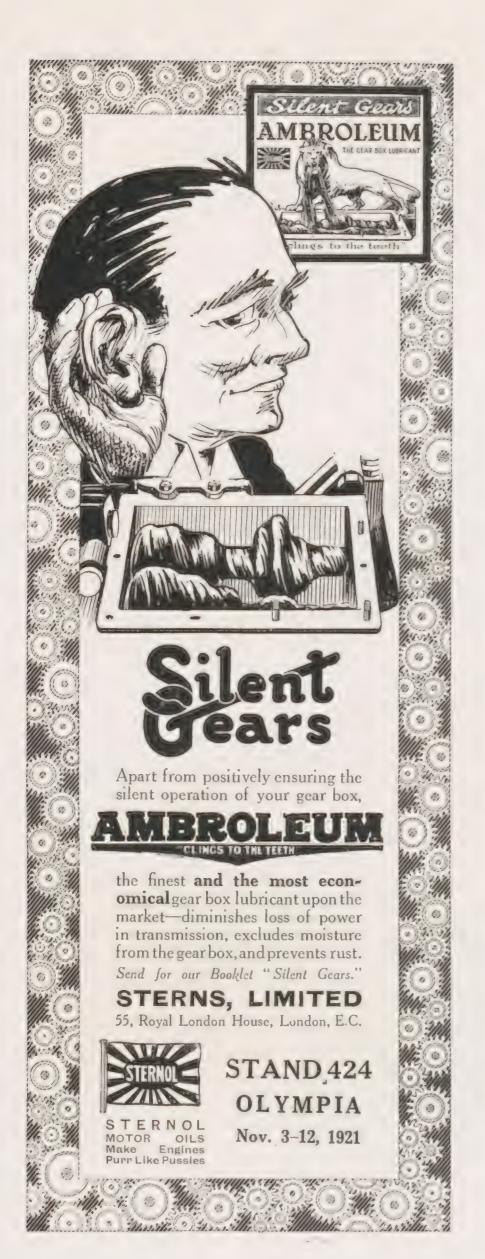
THE SUNBEAM MOTOR CAR CO. LTD., WOLVERHAMPTON

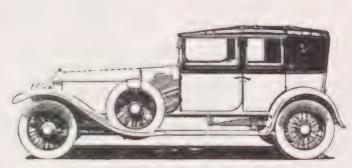
LONDON SHOWROOMS - - 12 PRINCES ST., HANOVER SQ., W.1

MANCHESTER SHOWROOMS - - 106 DEANSGATE

Southern Service and Repair Works - 177 The Vale, Acton, London, W.3

EXPORT DEPARTMENT - 12 PRINCES ST., HANOVER SQ., LONDON, W.1





BARKER ENCLOSED CABRIOLET

BARKER BODIES

OLYMPIA—STAND 328

FROM 1710 to 1921 is a long span of years, yet from the time that Barker & Co., were founded as Coachbuilders in the reign of Queen Anne, when they built coaches and carriages for Royalty and Nobility, until to-day, the name "Barker" has always been synonymous with all that is best in coachbuilding.

An Appreciation from

His Highness The MAHARAJAH DHIRAJ OF PATIALA.

- "Gentlemen,
 "I am directed by his Highness the Maharajah Dhiraj of Patiala to
 "convey to you his warm approval of the beautiful Saloon Limousine.

 B dy that you have recently built for his Highness's Rolls-Royce car.

 "His Highness is extremely pleased with it and desires me to congratulate "ou on the admirable work the firm is capable of turning out. In "design and comfort the body leaves nothing to be desired.

 "Yours faithfully,

 "(Signed) SAMPAT SINGH, Lt.-Col., Military Secretary, Patiala."

Further high praise.

greatest admiration.

- Dear Sirs,

 "I have now experienced the pleasure of your fifth body, a "four-seater, on my new Rolls-Royce, Alpine Eagle, a worthy and necessary combination if one aspires to perfection.

 "The undoubted improvement in the Rolls Chassis over the "older model is only equalled by the great advance in the Body work, and I must congretulite you on the beautiful lines and perfect finish of my latest Car, and can only add that it has received all round the greatest admiration.

"Yours faithfully, "(Signed) JAMES P. HUMPHRIES."

(Coachbuilders), Ltd.

By Appointment to H.M. the King and H.R.H. the Prince of Wales. London Retailers and Body Specialists for Rolls-Royce Cars. Bodies built to suit customers' special requirements.

(6, SOUTH AUDLEY STREET, LONDON, W.1.

Adams



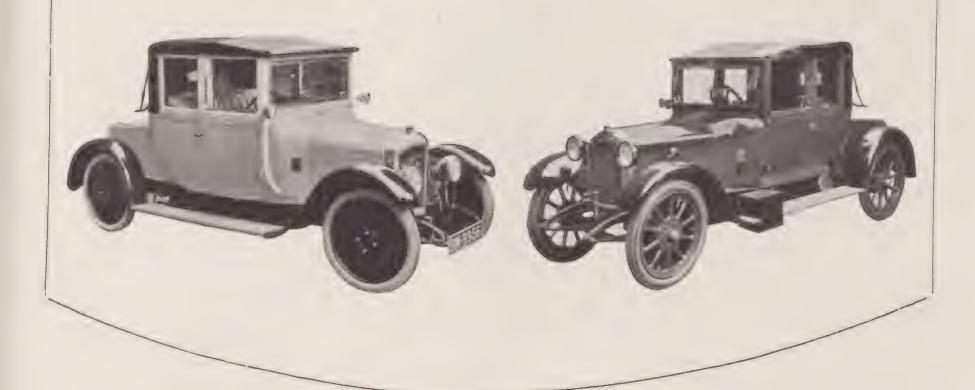
ACCOMMODATION FOR ÆSCULAPIUS.

THE IDE IL DOCTOR'S C.IR.

Representative Specimens of Coachwork to be Seen at the Show.



The top teft hand car is a standard Calcott coupé, priced at £595. On the right is a Bean fitted with the new sedan type of coachwork, while below is the latest model 12–14 h.p. de Dion with a coupé body by Mann, Egerton's. The remaining vehicle, a 12 h.p. Rover, has similar coachwork by the same firm.





PURSUIT OF THE UNEATABLE. THE

By Captain P. A. Barron.

"If gentlemen of the old school think I have written ribaldry on a sacred subject, I offer them my apologies. My folly is not meant for them."

YINCE the war the sport of house hunting has almost superseded fox hunting, and it is said by experts that the foxes of the present day are so badly in need of exercise that the breed is in danger of

degeneration.

It is rumoured that petitions are to be presented to Parliament by those who have the interests of these pretty little pets at heart, and it is proposed that powers should be taken to enforce the closing of all shops and businesses for at least three days a week during the hunting season in order that all classes shall in future be able to take part in the national work of keeping the famous English foxes up to the old standard of excellence.

In the past the entire work of rearing, preserving, and physically exercising our foxes has been done by the wealthy classes at their own expense. They have performed the duty without complaint, but now that they have sold their houses and horses in order to pay for doles to the unemployed, it is considered that the duties should be shared.

Fox hunters are now watching the progress of legislation with keen interest. It is understood that the Board of Health (British Foxes Dept.) will recommend that all horses taken from the aristocracy in part payment of taxes should be handed over to the unemployed, who will then be enabled to 'unt-hunt, I mean-at the public

As so many of the newly rich will, by these methods, be induced to hunt this season, it may be advisable to publish some authentic information for their guidance. It is believed that many of the facts are presented for the

first time.

Hounds, Pack of .- A pack consists of fifty-two, and sometimes a Joker. They are dealt out equally to the players by the Master of Foxhounds. The game is somewhat similar to "Snap," as the object of each player, or huntsman, is to collect all the hounds from the other players. In order to do this he tries to find a fox. The usual method is to ride into a covert (a term to be explained later) and blow a horn. Foxes are fond of music, so the sweet sounds lure them from their nests. When a huntsman sees one of the dear little things, he calls his dogs by name, and they gather round barking with excitement. The noise attracts hounds from the other players.

The skill of the huntsman is now shown. He rides at full speed, blowing

The Baron de Profits de Guerre studies the book of rules.

his horn continuously, and the fox, who recognises him as a friend, follows him. If the right moment has been chosen the entire pack will stream after the huntsman and his fox, leaving all the other players houndless and

dejected.

It is difficult for the exultant and victorious huntsman to restrain his enthusiasm when he finds himself in front of the pack, leading them triumphantly over hedges and ditches. His brave horse, either a real hunter or a half-hunter, opens his throttle to the utmost. His speed becomes delirious. Often it is difficult to restrain him sufficiently to enable the fox to keep up the pace. A good huntsman will, however, never outrun his fox, but will keep it at heel for miles, and when he thinks it has been exercised sufficiently he will lead it back gently to its covert, whip off the dogs, and then go to receive the congratulations of the Master of Foxhounds.

The pack is then re-dealt, and the

game proceeds.

Hounds, Care of .- A high authority states that "a foxhound should be 231 inches high; his legs straight; his bone well carried down; his feet round; his neck clean." The last is important. Every huntsman should wash the neck of his hound carefully. A moment's thought will enable him to realise that nature has not provided the beautiful animals with means of washing the backs of their necks.

The best methods of feeding hounds are often discussed. Oatmeal and biscuits are their usual fare. Oatmeal should be cooked carefully and served in porridge plates with sugar, and milk or cream to taste. The diet may be varied by biscuits, of which there are many patented brands. Some of these look like firelighters, and others like Roman bricks. The latter are of small value as building material, though weatherproof. They are case-hardened by a special process, the object being to make the teeth of the hounds blunt so that they cannot injure a fox.

Hounds follow huntsmen by scent,

and must be trained to distinguish perfumes. Most hounds are attracted by "Jockey Club," but some cubs are fond of "Bouquet d'Amour" or Patchouli until they have cut their wisdom fangs.

Huntsmen, Dress of.-The most glorious thing about hunting is that it enables a man to wear a red coat without causing newspapers to rant about "scarlet folly." All huntsmen wear "pink" except some of the very best. War medals should not be worn unless the Master of Foxhounds is a General, and even then it is inadvisable unless the General can show more medals than any other member of the hunt. Swords are never carried except at weddings and hunt balls. The only weapon allowed is the hunting horn, which, according to the rules, must not be electrically or mechanically operated.

Golfing hose and Panama hats are not favoured by many Masters of Foxhounds.

The only disadvantage of "pink' is that it shows the marks of wet paint or tar so often found by huntsmen when they dismount to clamber over fences or gates. For this reason many sportsmen do not hunt, and wear pink only on social occasions. Among these are many whose hunting stories have a fine literary flavour, and they usually show their love of animals by displaying in their halls the heads of many favourite foxes that have died of old age.

Fox Hunting, Definitions of.—The most famous definition of the sport is "the pursuit of the uneatable by the unspeakable."

Coveri.—A covert is a place in which foxes make their nests or holes. A full-sized covert has eighteen holes, but some belonging to the smaller hunting clubs have only nine. In the artificially produced coverts each hole is marked by a small red flag, which enables a fox to make a safe putt when he goes home tired. Without a guide of this kind a fox cannot always be relied upon to hole out in one when hurried.

Earth Stopping.—This is an unsportsmanlike custom. The Earth Stopper goes out late at night with a lantern and a spade. At this time the foxes are not at home. They are inspecting the poultry at neighbouring farms. Meanly taking advantage of their absence, the Earth Stopper removes the red flags and deliberately fills up the holes with earth. Presently the foxes return, well fed and sleepy, and

to their amazement find that there are no holes on the greens. The poor fellows have to camp out of doors for the remainder of the night, and, unless the merciful huntsman wakes them early with his horn, they are sometimes caught by the hounds, who welcome anything as a change from oatmeal. Many valuable foxes have been lost in this way, and this cruel practice should be abolished.

Shooting Foxes.—The less said about this the better. It is not done by the best people.

Trapping Foxes.—If you want to do this, go to Labrador; you are not fit to live in England.

Harpoonong Foxes.—An old English sport now extinct.

Foxgloves.—A kind of gauntlet worn by huntsmen who have once been bitten by foxes and are, therefore, twice shy.



"Hunter: A large horse trained to jump obstacles with or without a rider. Many riders find that they jump farther without."

Brush.—The fluffy end of a fox, which sportsmen treasure in order to verify and adorn their tales.

Hunter.—A large horse trained to jump obstacles with or without a rider. Many riders find that they jump farther without.

Armed with a knowledge of this vocabulary, a newcomer to the sport may go to his tailor and order his hunting kit. He should then place an order with the local master of foxhounds for some foxes and hounds. With these he can practice at home until he feels that he has mastered the rudiments of the sport sufficiently to take the field

He may also order a horse, which should have been already tamed. Some people take riding lessons, and others fall on the ground instead of on tan. Tan is softer.

Of late years many motorists have found it more comfortable to hunt in cars than to do so on horseback, but the practice is being discouraged. Few cars are good jumpers, and tanks which can climb obstacles and cross ditches are too slow. Proposals to train foxes to run along the roads instead of going across country are not favoured by the best hunting folk.

In old days, before the landed gentry of England had become extinct, foxhunting was regarded as the most noble of all sports. There were enthusiasts who lived to hunt, and some of them believed that many of England's wars were won on the hunting field. By this they meant that the hard riding English gentleman made the finest cavalry leader in the world. One who thought so was the Duke of Wellington, who indented for foxhounds during the Peninsular War in order that he and his officers might hunt when things in the fighting line were slack. There are still antiquated regiments in which the hunting tradition is preserved, and some few of our aristocrats, who have succeeded in evading the tax collectors, and are therefore able to keep horses, still pursue the inedible fox.

Times change, and with them the joys of sport.

"Pleasure that the most enchants us Seems the soonest done; What is life, with all it grants us, But a hunting run?"

If gentlemen of the old school think I have written ribaldry on a sacred subject, I offer them my apologies. My folly is not meant for them.

WHEN NO EXP

No country in particular specialises in the luxury car, but Great Britain can hold her own in the markets of the world. The motor car of to-day, whether British or foreign can be made a very luxurious and altogether desirable vehicle by those fortunate individuals

HE original motor carriage was a compromise, and, viewed in the light of modern demands, a poor one. Coachbuilders had no basis to work upon, but their knowledge of horse-drawn carriage requirements. The result was that the fitting of the one part of the complete vehicle to the other appeared like a particularly bad specimen of amateur plumbing.

This stage soon passed, however, the turning point being reached when the engineer, the chassis designer, at last awakened to the fact that he must pay attention to the plaints of the coachbuilder—that the two were complementary to each other, neither being much good without the other.

So we began to get the modern motor carriage. We passed through many stages of transition, from the Roi des Belges body to the torpedo, and from the draughty Cape-cart hood to the all-enclosed saloon, before reaching our present stage; but now we have reached it, is it too much to say that we have wellnigh reached perfection?

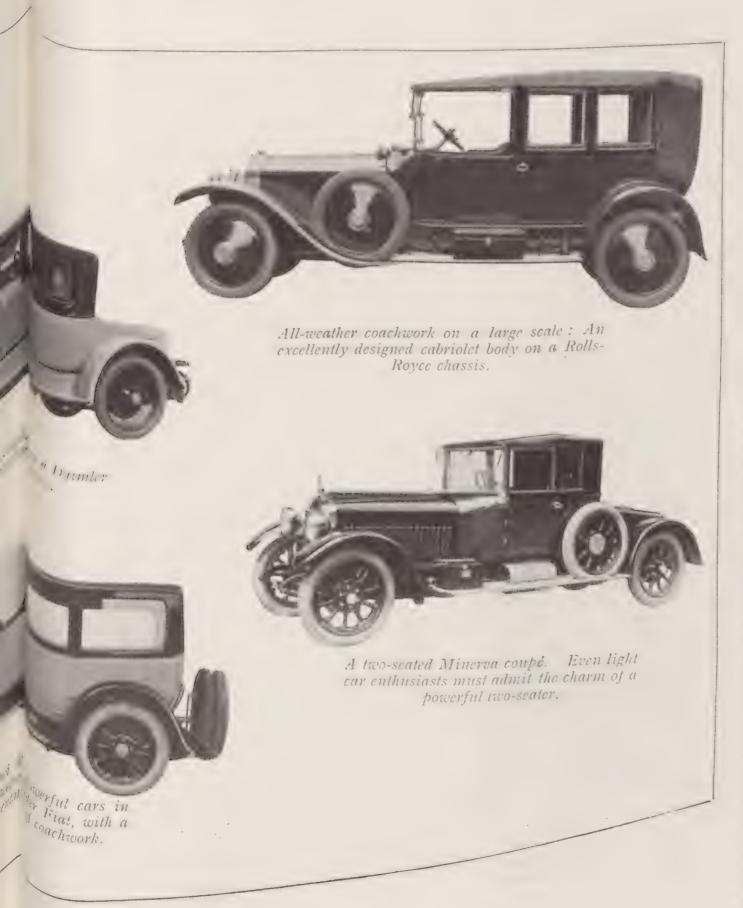
When expense is no object we can obtain a carriage providing almost inconceivable luxury; but perhaps more notable still is the wonderful range of choice that lies between the cheapest air-cooled two-seater and, shall we say, the Elizalde exhibited in Paris. There appears to be a car for every purpose and a car for every pocket, a certain necessary minimum of income being granted. Luxury does not necessarily involve magnitude. There are, as a fact, many really luxurious small cars, but at the same time it is only reasonable to allow both coachbuilder and engineer plenty of room in which to carry their ideas into effect. Therefore the luxury car is usually a large car. It may, however, even-then be but a two-seater. We illustrate on this page, for example, cars of the true luxury type to carry seven; and equally luxurious vehicles designed to accommodate two pas-

To a certain extent, of course, the



E IS SPARED.

their pence are not debarred from sharing in the developments that make for comfort, for some most luxurious moderate-powered vehicles are now obtainable at a reasonable price.



chassis designer is concerned with luxury. Naturally, one cannot fit wonderful coachwork to a chassis having a noisy engine or poor springs, or the whole effect would be spoilt. Beyond this, and the fact that the bodywork must be soundly made of good materials, that the seats must be adequately sprung and padded, what really is luxury: Is it not mainly a question of externals; in fact,

of accessories?

The type of body counts, of course, but that, again, is largely a matter of personal taste. For the average car user, the most suitable body is one that absolutely excludes the weather in winter, but allows him unhampered enjoyment of the more favourable conditions of spring and summer. Such a body is a comparatively recent development-for the landaulet, which of course, we have had for many years, does not provide the summer enjoyment that we have in mind-and curiously enough, although it is most distinctly a development of luxury, it is by no means limited to expensive cars. Nor does its fitting to an inexpensive chassis render the complete vehicle expensive.

The fittings that ultimately spell luxury—the flower vases, cigar lighters, car warmers, interior lights and so forth—are not necessarily expensive in themselves, although if one insists on real silver and onyx, there is not much difficulty in making the total soar.

The fact of the matter is that luxury is not a sheer question of cost. It is more a matter of judicious selection. One would not fit, for example, a cigar lighter in a car to be used exclusively by non-smokers. This is extreme, perhaps, but all too frequently much money is spent upon things that absolutely do not matter. Waste is more expensive in the long run than properly considered luxury.

When all is said and done, however, money does talk in regard to motoring comfort; and the most modest minded of motorists cannot help occasionally admiring a £3,000 car—and, maybe,

envying its owner.



THE SPIRIT OF MOTORING.

By C. S. Brooke.

Whether one cares for lusty waterfalls, decrepit castles and abbeys, the wind on the heath, the distant view, or whether one drives for driving's sake; whether one even uses the car merely as a means of conveyance, one realises that the Spirit of Motoring has, somewhat paradoxically, something like a backbone. Trade depression, in fact, is only temporary.

OTORING, let it be understood—the spirit of motoring, the sport, the pastime, or whatever you choose to term the practice of a means of travel that for pleasure transcends railway travelling by not less than the speed of an express train surpasses the speed of a donkey-cart with the donkey doing its worst. I am no more an engineer —one blushes to say it in such a mechanical age—than a pedagogue: no more a business man-so at least I have been told by candid friendsthan a wandering minstrel. More than those presents, I am either too old or too diffident by nature to practice the art —gentle it may be, of a certainty 'tis vain—the art that in polite circles -where words are often used rather to cover thoughts than to convey them—is commonly referred to as the art of teaching one's grandmotherthe benign old soul !-- to suck eggs. Still more, I am not even a Superman. Nobody ever gave me a cool fifty thousand sterling at leaving.

And so I, being what I am—a plain fellow from the country, not addicted to wearing my hair long, as a spring poet, nor cropped close, as it is cropped at the Scrubbs and on Dartmoor; not addicted (to emphasise the matter) to white spats, nor (to clinch it) a bonerimmed monocle at the far end of a watered-silk ribbon—I, in traversing this high subject, the Spirit of Motoring, shall leave to others the task of telling the trade all about mass production, engine-design, pricesetting, methods of advertising, and all the other things that the trade itself, were it not so modest, might be adjudged as knowing better than its self-constituted teachers, and confine myself to a consideration of what are termed in learned circles First Causes.

Motoring, one knows, is something more than a sport, pastime, or means to travel for pleasure. Nevertheless that phase of it, accompanied by much tinkering, was the original phase, and it is become again the leading phase now that the captains—all honour to

them!—are plain misters again, and the Kings are left scratching their heads, exclaiming Donnerwetter! and taking unto themselves the wisdom, saddening but not wholly useless, known as wisdom after the event. It is as true as it is trite to say that the War opened the eyes of the world to the possibilities of motor traction, but not less true to say that, great as is the extent to which those possibilities



Captain Malcolm Campbell, the victim of this month's MOTOR OWNER Cartoon, published as a Supplement to this November Number.

have been realised, the pleasure car is still as royal, as much the King of the Road, as the bicycle was throughout the "'Eighties" and in to the middle of the "'Nineties" of the last century. And for the same reason. The bicycle gave its rider the freedom of the open road; the car gives its users an even greater freedom of the self-same very joyous travelling companion. One knows, of course, that there are many good folk for whom the car is in a general way merely a substitute for the horsed carriage. The car, by such, is used for the purpose of paying morning calls, and for shopping, for theatre-going, for getting to and from the station, the office, or the links, or for all such purposes together-in a general way. One also knows-what strange things one does know !-- that there are people so constituted as not to care a "tuppenny tinker's damn" for lusty waterfalls, decrepit castles and abbeys, the wind on the heath, the distant view, the morning freshness, the evening silence, the lapping of the sea, nor yet-

"The moan of doves in immemorial elms,

And murmuring of innumerable bees."

I once heard of a man who possessed eight cars but had not, when he was gathered to his fathers, travelled forty miles from home by any one of them, and of another who sent his big car on to his shooting-lodge in the Scottish Highlands by rail. But that was in the "good old days," when to start on a journey by car was not invariably as "simple as pie," and to finish at one's objective according to schedule, was to rate oneself extraordinarily lucky, and, without question, to be so.

Still, as some ears are deaf to music, whether tone music or the music of words, so are there ears deaf to the call of the road. One may venture, however, to suppose that not all, by a long chalk, of those who, in a general way, treat their cars as hacks are so terribly afflicted. On the contrary,



"Blue Birds!"

CAPTAIN MALCOLM CAMPBELL

•



DRIVING FOR DRIVING'S SAKE?

one dare hazard that quite an appreciable majority of such users give themselves over, heart and soul, to the companionship of the road between whiles; and that whereas the occasions of "in a general way" are reckoned as ordinary "lawful occasions," the occasions of the betweenwhiles, no matter how regular their recurrence, are voted joyous occasions, many of them, indeed, red-letter. It may be admitted too, as freely as you like, that driving for driving's sake has charms, and that—though in this case only up to a point-fettling qua fettling is alluring. I, who myself have a liking for messing about a boat—a liking, indeed, so strong that it would amount to a passion were I able to give it full rein-can imagine my neighbour devoting a fine Saturday forenoon, afternoon, and evening—to messing around with spanners and an oiled rag; for the one sort of messing is in no sense more unreasonable than the other. But just as I probably should tire of the spokeshaving, the painting, the var-

\$

nishing and the caulking were I convinced that, do what I might, she would inevitably refuse to float, so, I conceive, might my neighbour fall out of conceit with his oiled rag were he not less convinced that, for all his coaxings, his loving-kindness, and his prayers, the thing-yes, one fears that he might speak thus ignominiously of his once-cherished machine-would, the next day-it being, as usual, Sunday—refuse to budge under the power with which Mr. Henry Ford and his umpteen thousand "hands'

originally endowed it.

As to driving for driving's sake, I am of the opinion that it connotes a consideration, though not necessarily an affection, for the road. devotee of driving, whatever his joy in speed, and revel as he may in the sporting risk, might be hard put to it to maintain his enthusiasm at high pressure, or even at normal, were all roads as rocky as the proverbial road to Dublin; as heavily laden with traffic as the Ripley road on a fine summer Sunday afternoon; as dead straight

and as equally monotonous as the sixteen-mile length of the Fosse from Newark to Lincoln; or as atrabilious one uses that word in this present connection as a substitute for a word, or words, that ought not to be uttered -as another sixteen-mile stretchthe length of the late Thomas Telford's Holyhead road from Smallheath, through Birmingham, West Bromwich, Wednesbury and Bilston, to Wolverhampton. I knew a man-he was uncommonly likable, one of those good fellows whom men respect and women (not all of them perverse) do, some their best and some their worst to spoil-who once spent all the working hours of eight successive days driving up and down one of those stretches, full length for full length, and no shirking, until at last, about nine o'clock of the evening of the eighth day, they-you will know to whom I refer—impounded the car and put him, himself, in a place that, however objectionable, was reasonably safe. It is true that during those eight days he, an analytical chemist by



An interior-drive saloon body on an Armstrong-Siddeley chassis. This is the most up-to-date example of Messrs. W. H. Arnold's coachwork, and-

profession, had taken samples of most of the various poisons that the houses on that length of road are "licensed to sell retail," nevertheless, I remain of the opinion I formed at the time—that, upsetting as it may be freely to mix drinks, and however the health of "our people" (as the leader writers, with a fine sense of their own exclusiveness, term you and me and the others) might be improved were the Sale of Poisonous Drugs Act so amended as to include bad beer, doubtful wine, and worse spirits, the root cause of my friend's, the analytical chemist's, decidedly unpleasant visions-pink, grouse, and yellow tadpoles with little green spots, were by no means the least objectionable actors in the visions -was that truly depressing road and the frequency, day after day on end, with which our B.Sc. traversed it.

One thing with another then, the utilitarianism of the car admitted, the joy of sheer driving also admitted, and, as well, the potency of the pleasure to be got out of overhauling, adjusting, and fetting, it is not unreason-

able to argue that all these things are more or less dependent upon the road. Roundly speaking, the road, as it was in the beginning of motoring, is still the backbone of the sport, and so must remain for an appreciable duration of time to come, say the apostles of flying what they will. Any man with two penn'orth of imagination, and especially any such man who has lived to make common use of the inventions and discoveries of this generation and the preceding one, would hesitate to scoff at the aspirations of the flying folk. But the earth is more—how very much more!-man's habit than the firmament, and though man, as we have lately seen, with a vengeance, may be shaken out of his habit under duress, remove the duress and he, as has still more lately been seen, quite readily reverts to his habit. There are the "tite barnacles" of Whitehall and the sheds for which Whitehall stands. you may say. Just so! I answer; but the War did not create the "tite barnacle" as such, any more than it caused one single leopard to change its

spots. All that the War did was to give the genus the chance to function according to its kind. That was all, but it is not to say—by the nine gods and the myriads of little fishes, it is not!—that it was not enough and to spare.

We may be assured, therefore, that the Spirit of Motoring has something like a backbone. Lately the outlook, as reflected in the order books of the trade, has been lowering, a sort of outlook-leaden, colourless-that comes with the east wind. But as sure as night follows day, so sure is it that day returns, and not less sure that the east wind cannot continue to monopolise the heath indefinitely. In escaping from the jungle our relief was such that we failed to realise that the jungle might have a shadow. The error of judgment was pardonable, for though it is given to men to walk the earth like gods, it is not so given to all men, nor indeed to all of those, lucky bargees! who get fifty thousand at leaving, instead of a copy of Dean Stanley's "Sinai and Palestine" in half calf.



-is in striking contrast with this specimen made by the same firm in 1897. Early automobile coachwork was little more than a modification of the existing horse-drawn carriage.

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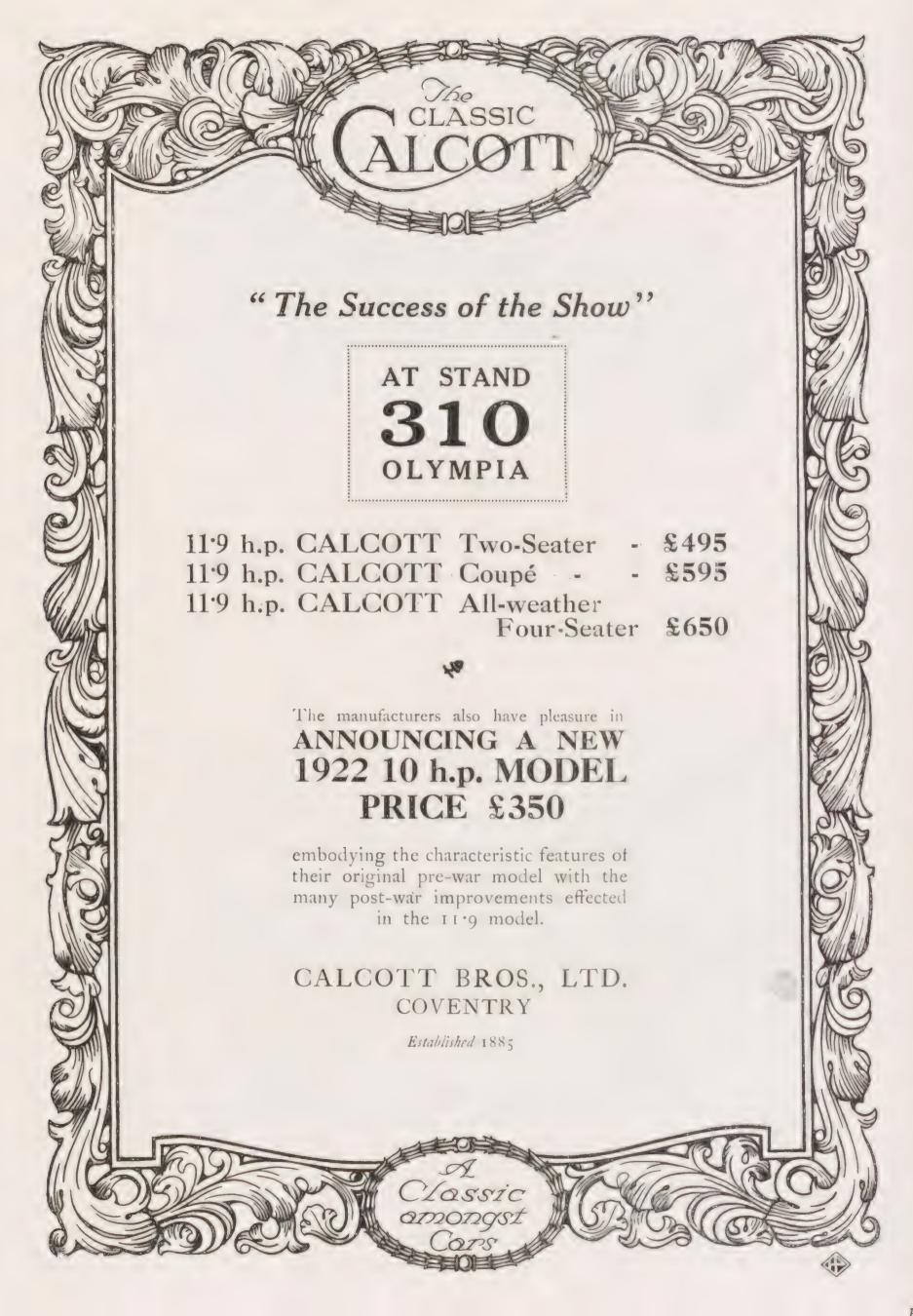
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2056 1

OTON W.NEF

THE JUICE AN' ALL.

By Wilfred Gordon Aston.

Petrol consumption tests need to be scientifically conducted, for consumption depends upon a multitude of small details. Haphazard methods are almost worse than useless.

SUPPOSE in course of time I shall come to forgive the Coal Strike of 1921, but the last thing I shall forgive it for is, I promise you, the fact that it put an end to the National Fuel Economy Competition which the Motor Owner, up to this unexpected interference, had organised so excellently in conjunction with the R.A.C.

If I had been consulted as to the action that ought to have been taken when this unlooked for disturbance cropped up, I should have been all for holding the competition—and be hanged to what anybody else said. Shortage of coal meant lack of benzole -the only fuel produced in this country. Lack of benzole meant living (as some of us are now doing) on what comes in from outside. What better opportunity, then, could there be for demonstrating on a big scale the economy in fuel which any private motorist has (if he chooses) the means of obtaining? However, the Powers-that-Be thought otherwise. Far be it from me (in these columns, of all places) to kick

against the pricks.

There are two things about which genuine out-an-out full-blooded nonsense is habitually talked in motoring circles. One of them is Speed. Some day I hope to "have a go" at that subject from the unbeliever's point of view. The other is Petrol Consumption. And I propose to have a go at that now.

I was ripened for an onslaught of this kind, inasmuch as a short time ago, a very large piece of paper was sent me by a responsible authority which, amongst other things, recorded that a certain light car of hitherto unblemished reputation had succeeded in covering no less a distance than sixty miles upon one

gallon of petrol. I had little enough tolerance to read further, but I fancy I did catch a sentence, in small print, to the effect that the driver in this particular "test" was allowed to switch off his engine and descend hills "in neutral." Again, if my memory is still working decently, he started from an arbitrary point on the Portsmouth Road, and simply carried on until the car came to a standstill. The total distance travelled, he having started with a gallon of fuel in his tank, was taken as indicating the mileage per gallon. And very nice, too.

mileage per gallon. And very nice, too.

I congratulate everybody concerned upon a wonderful performance. Only, does it mean anything? Does it help forward the good work? Does it teach us something? Can we learn something from it?

It is difficult to give an affirmative to any of these questions, I'm afraid, after all, it was only a "stunt." Legitimate, I grant you, but still a stunt.

What was in any case an interesting undertaktounding I am all (say) the hill gaily will even batteries an electring infinite n a speciall I will stan and finish And just pose my



A 15.9 h.p. Humber in touring trim.

figure might easily have been a truly informative and valuable record had it not been for the trifling discrepancies which I have taken the liberty of mentioning. Perhaps it is a little hypercritical on my part, but I hope to be forgiven for bringing them forward.

Item. No mention was made of the height (above sea level) of the point at which the car started, nor of the height (above sea level) of the point on the road at which it stopped. This is a pity as it vitiates results somewhat seriously. A careful carburetter controller may (I don't say "did") manipulate his petrol consumption so that the last drop just gets him to the top of a favourable gradient. Down this he may joyfully run for half a mile, perhaps more, on a perfectly dry tank. Every little bit helps. I will undertake to set up perfectly astounding fuel consumption figures if I am allowed to start at the top of (say) the Hindhead and coast down hill gaily until the wheels stop. I will even undertake (especially if my batteries are "full-up" and I have an electric engine starter), to do an infinite number of miles per gallon on a specially-selected trip like this, for I will start with o o gallons in the tank and finish with o'o gallons in the tank. And just to get good measure, I suppose my batteries can be counted

upon to get me a few hundred yards. Not that that matters very much, as in any case anything divided by nought is Infinity.

Item. No mention was made of speed. Strange as it may seem, speed does have a very important bearing upon petrol consumption. On some cars 40 miles per hour takes twice as much fuel per mile as 20 miles per hour, in others it takes fifty per cent. more. But it is

cent. more. But it is very hard to think of a modern car which can possibly take *less*; or even an equal amount of fuel per mile at high speed than it does at normal pace. On several cars I have carefully tested, from 12 to 16 miles per hour proved to be the most economical speed. Seeing, however,

that no one ever dreams of maintaining such absurd figures, possibly petrol consumption per mile is not of much interest to the ordinary motorist, who would never tolerate for more than a few minutes the conditions under which it is obtainable. I can produce (and they will both be equally well-timed) a big six-cylinder that will do 25 miles to the gallon, and a small 10-h.p. light car that will only do 15 or so. But not when their speeds are kept the same. Not on your life!

Item. No mention was made of road surface. Bless me! I am critical. Am I not? Want to know everything, don't I? Yes, I confess I should like to know a bit about the conditions of the road. You see a heavy, sticky, crumbly highway may have close upon double the traction resistance of a smooth, dry, hard surface, and as a great deal of the engine power is absorbed in overcoming this particular form of friction, apart from the mechanical friction of the engine and transmission, you can easily see that a big difference might be ascribed to this source. People don't seem to realise that if we fitted our cars with steel rims and ran them on rails (even keeping steep gradients) we should habitually get not only extraordinarily high speeds, but perfectly fabulous fuel economy. Road engineers and tyre manufacturers are trying to approximate to such favourable conditions, but I'm afraid they are a long way off attaining them-

yet. Item. No mention was made of wind. Perhaps, just lately, this agency has not made very much difference either way, but there is no doubt about its capabilities of doing so. Ever taken the trouble to see how it affected your petrol consumption when you were thrusting into a thirty mile an hour breeze? No? Well, of course, you want a flow-

meter, or a miles-per-gallon indicator to show you, but I can affirm that with an instrument of this sort it becomes very obvious indeed. Ever fitted an air-speed-indicator on your car? No? Well, then, perhaps you wouldn't realise that with a bit of a start, with the hood up and a wind plumb behind you can do quite a respectable speed

on a flat level road with the gear in neutral, providing your brakes are not binding and the road wheel bearings are in good condition. Nevertheless, this is a fact. I reckon that with a 20-mile an hour steady wind dead ahead or dead astern will, at moderate road speeds, make a difference of as much as 25 per cent. in fuel con-

sumption.

Item. No mention was made of carburetter setting. What would the car do when it was "all out?" A few months ago I came across an enthusiast for economy who had reduced his jets until you wanted a steep decline to push you up to as little as 30 miles per hour, and you couldn't drive the car at all until the engine was hot. What sensible motorist is going to go to such lengths? He is merely robbing Peter to pay Paul, and if he has any notion of motoring enjoyment, or any idea of saving time, or any notion of getting out of his car what it was intended to give, he is losing pretty heavily on the deal. Cut down your jets by all means, they are generally too large on a new car anyhow, but if you're going to lop the last 15 miles per hour off the speed scale, do it in a logical manner. Buy a smaller engined car!

Now the last thing I want to suggest is that the performance to which I referred above was obtained with all these various conditions in its favour. It is very unlikely that they were all in its favour at the same time, though they might have been,

Having been a destructive critic let me now make an attempt to be a little more constructive.

There is only one really scientific venue for petrol consumption tests, and that is Brooklands track. If you measure the fuel consumed on any number of complete circuits you wash out (to all intents and purposes) any effects introduced by gradients which, in any event, are not very steep. Next you can maintain, without danger or difficulty, a definite speed making your average very close to your maximum. This is desirable, because, unless you can keep a steady speed you can get very different results from the same average speed. Next, the traction resistance of the track, either dry or wet, is a pretty accurately known quantity. If the miles per gallon on Brooklands is known, it is quite easy to calculate what it should be on roads of varying character of surface, as scientists have worked all this sort of thing out with an accelerometer. And if you distrust their conclusions you can work it all out for yourself. It is really rather amusing.

Next, you can (practically) wash out the influence of the wind. A little thought will show that on a circuit you can never quite neutralise it, but only a very stiff wind would make a difference worth speaking of.

Finally, you can see whether the carburetter setting which gives you decent economy is also going to yield you decent speed, acceleration and

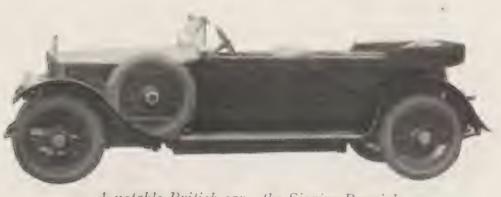
so forth.

I hope that when THE MOTOR OWNER once more takes up its selfimposed, but none the less valuable, task of showing what fuel economy really is, it will, in addition to the more sporting competitions at various centres in the country, organise a really scientific show at Brooklands. Such a demonstration is very badly wanted. If for no other reason, for

this, that it will put a stop to so many nonsensical claims by telling us

the plain truth.

And, oh, please Mr. Editor, let the cars be tested each at, at least, five different speeds. Some carburetters have such funny "weak" and "rich" spots-and you may just as well find them out.



A notable British car—the Sizaire-Berwick.

but nevertheless if no notice was taken of them the results, in my judgment. are rendered perfectly valueless. The conditions might have all been united against this car, as far as I know, but even supposing that was the case, we are no better off so far as information is concerned unless we know all about them.





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WHEN THE FOOTLIGHTS CEASE FROM TROUND

Photographs of the popular heroines of the stage taken "off" are always interesting, whatever the mood in which the camera catches



Miss Marjorie Gordon takes her case and, maybe, meditates upon past triumphs and future successes. In the centre, Miss Renée Kelley spends a less restful leisure.



UNG AND THE DROP SCENE IS AT REST!

them. In this case the pensiveness—pretty, if studied—of two of our subjects is in striking contrast to the energetic pose of the third.





"Reflections": Miss Sybil Hook, also in pensive mood. The swans supply a note of interrogation as to the subject of her thoughts.



$C \mathcal{A} N N E D C \mathcal{A} R F \mathcal{A} C T S.$

Below are given the main facts of the majority of 1922 cars, with the prices of the complete wehicles.

Where this figure has been unobtainable, the letter "C" denotes chassis price only.

Make and No, of Cyls.	R.A.C. Ritg.	Bore and Stroke.	Price Complete.	Make and No. of Cyls.		R.A.C. Ratg.	Bore and Stroke.	Price Complete.	Make and No. of Cyls.	R.A.C. Ratg.	Bore and Stroke.	Price Complete.
A.B.C. (2)	12.0	91'5×91'5	£ 355 gns.	Fiat (4)		10.4	65×110	550	Paige (6)	29 . 5	3½×5½ in.	1,300
A.C. (4)	11.8	69×100 65×100	550 650 gns.	891 . ()		13.0	75 × 130 75 × 130	800	Paige (6)	33 ° 7	3½×5 in.	1,350
A.C. (6) Albert (4)	15.7	68×103	495	F.N. (4)		17.9	85 × 120	980 675 (c)	Palladium (4) Phœnix (4)	11.0	69 × 100	418
Alfa-Romeo (4)	24.0	100 % 130	3	(0 20 1)	u 0	20.1	90×150	800 (c)	Phœnix (4)	18.2	85×135	650
Alsace (4) Alvis (4)	19.6	$3\frac{1}{2} \times 5$ in, 65×110	550						{Pilain (4)	10.4	65×130	725
Alvis (4)	11.2	68×110	595	13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		10.5	65×110	450	1000			
Apperson (8) Argyll (4)	33.8	3½ × 5 in. 80 × 130	900	13 1013		25.7	68 × 114 72 × 125	?	Rhode (4)	9.5	62 × 90 65 · 8 × 110	. 275 500
Armstrong-Siddeley				G.W.K. (2)		9.2	86×92	250 gs.	Rochet-Schneider (4)	15.9	80 X 130	417 ap.
(6) Arrol-Johnston (4)	17.9	69.5 × 104.8	? 650	G.W.K. (4)		10.9	66 × 100	295 gs.	Rochet-Schneider (6) Rolls-Royce (6)	37·2 48·6	100 × 130	1,084 ap
Ashton-Evans (4)	10.8	66×109 ·	395						Rover (2)	8.9	85×88	230 gs.
Austin (4)	12.8	72×102	535	TA A		11.0	69×120	650	Rover (4)	13.0	75 X 130	650
Austin (4)	22.4	95×127	095	1 8 Y A / \	1 0	13.0	75 × 120 66 × 109·5	750 440	Ruston-Hornsby (4)	20.08	80 × 130 90 × 130	585 650
*			2	Hotchkiss (4)		22.4	90% 140	2	, (4,1) 7 7 2 5 6	000
B.A.C. (4) Ballot 3 Litre (4)	9.5	62 × 100 69·9 × 130	?	FT . T / \		37.2	100 × 140 68 × 120	595	Seabrook (4)	0.8	63 × 120	?
Beardmore (4)	11.2	68×114	635	Humber (4)		15.9	80×140	850	Seneca (4)	15.6	79×115	425
Belsize (2)	8.9	85×114 90×110	665	100 4 1 1		16.9	83 × 140 76 × 130	595 650	Singer (4)	9.7	63 × 88	395
Belsize (4) Bentley 3 litre (4)	15.0	80×149	1,050 (c)		• •	-4 2	70 / 130	030	Sizaire Berwick (4)	17.0	95 × 160 85 × 120	1,550 875
Berliet (4)	20.0	90×130	?	T4=1= / . \	-	7 57 0 2	001100		Spyker (6)	33.5	95×135	3
Berliet (4) Bianchi (4)	12·I	100 × 140 70 × 110	645	84 2 763		26.8	83 × 130 85 × 130	1,150 1,250 (c)	Standard (4)	9.5	62×90 75×110	325 525
Bleriot Whippet	8.0	85×88	198				-51125	-,-,-,-	Stanley Steam (2)	16.5	4×5 in.	1,100 (c)
Briscoe (4)	9.8	3 × 5 in. 63 × 110	495 425	Jowett (2)		7.01	75 × 101 · 5	310	Star (4)	11.0	69 × 120 80 × 150	395 (c) 600 (c)
Briton (4) Briton (4)	11.4	68×120	475	Jonett (2)		7 0 1	73 / 101	3.0	Straker-Squire (4)	20.1	90×120	850
B.S.A. (2)	10.0	39.75×85	340	L'ina (9)		28.8	avein	77.17.15	Straker-Squire (6)	23.8	80×130	1,200 (c)
Bugatti (4)	18.3	68 × 100 31 × 41 in.	750	King (8)	* *	20-0	3 × 5 in.	750	Sunbeam (4)	12.9	72 × 120 80 × 150	960
Buick (6)	27.3	3 3 × 4 ½ in.	?						Sunbeam (6) .	23.8	80×150	3
				Lagonda (4) La Licorne (4)		10.4	69 × 95 65 × 100	395 415	Swallow (2)	8°0 8•0	85×97 63×85	170
Cadillac (8)	31 .52	31×51 in.	1,250	La Licorne (4)		II.I	67 / 120	585	Swift (4)	9.8	63×90	415
Calcott	11.0	69×110	495	Lanchester (6) Lancia (8)		38.4	4 × 5 in. 75 × 130	1,950 (c)	Swift (4)	11.0	69×130	595
Calthorpe (4) Calthorpe (4)	10.4	65×95 65×95	355	Leon Bollee (4)		15.9	80×130	550 (1)				
Carden (2)	6.98	75×80	100	Leyland (8)		39.9	89×146	?	Talbot-Darracq (4)	8	57×95	3
Carrow (4)	24.2	69 × 100 31 × 41 in.	495 645		- 1				Talbot-Darracq (4) Talbot-Darracq (4)	17.9	66×110 85×130	3
Chambers (4)	18.4	3 % × 4 in.	730		0 0	15.0	80×130	950	Talbot-Darracq (8)	27.9	75×130	3
Chevrolet (4) Clement-Talbot (4)	21.7	94×102 57×95	330 .	Magnetic (8) Majola (4)		31.8	80×130 65×105	1,200 (c)	Tamplin (2) Turner (4)	8.96	85.5 × 85 69.5 × 120	175 550
Clement-Talbot (4)	12.8	72×120	?	Maxwell (4)		20.9	92×114	420	Turner (4)		76×127	650
Clement-Talbot (4)	15.0	80×130	3	McKenzie (4) Meteorite (4)		10.8	66×110	425 475	" 			
Clement-Talbot (4) Cluley (4)	25°5	101°5×140 62×110	420	Minerva (4)		13.0	75×112	670 (c)	Unit (2)	8.9	85×88	252
Cluley (4)	11.8	69×110	450	Minerva (4)		20 1	90×140	840 (c) 1,090 (c)	Unit (4)	9.8	63×100	297
Crossley (4) Crossley (4)	25.6	90×150	895 1,050	Minerva (6)		30.1	90 × 140 79 × 108	575	1			
(rouch (2)	0.0	85×140	285(c)prov.	Moon (6)		25.3	108×114		Vauxhall (4)	13.9	75×130	750
Cubitt (4)	15.9	80×140	442	Morris Cowley (4) Morris Oxford (4)		11.0	69 · 5 × 102	375 510	Vauxhall (4) Velie (6)	22·4 25·35	95 × 140 3½ × 4½ in.	? 595
				1118 / . \		20.0	90×140	1,100	Vinot (4)	11.7	69×120	725
De Dion Bouton (4)	12.1	70 × 120	685						Vinot (4) Voisin (4)	8.0	80 × 130 60 × 110	850 600 (c)
De Dion Bouton (8) Deemster (4)	20.9	65 × 100 62 × 90	1,090	Napier (6)		38.9	4×5 in.	2,100 (c)	Vulcan (2)	9.0	85×90	?
Deemster (4)	11.0	69×100	475	Nash (6)		25.6	31×5 in.	595	Vulcan (4)		90×140	3
Delahaye (4) Diatto (4)	8.9	85 × 130 60 × 90	675 (c) 475	Noma (6)	0 0	25 .0	82×114	945	II.			
Diatto (4)	15.9	80×100	725	0.11		20		2	Warren-Lambert (4)	11.0	69×100	350
Diatto (4)	17.9	85×130 83×127	795 425	Oakland (6) Overland (4)		19.0	71 °4 × 120 °6	?	Waverley (4) Wilton (4)	14.4	76×127 69 · 5×120	. 595 475
Dixie-Flyer (4) Dixie-Flyer (4)	17.0	89×127	455	(4)			3174 1111		Wolseley (2)	7.0	82×92	2
Dort (4)	19.6	89×127	395						Wolseley (4) Wolseley (4)	10.5	65 × 95 80 × 130	475 795
		1		Packard (12)		43 • 2	76×127	?	Wolseley (4)	23.5	80×130	1,200
Enfield-Allday (4)	10.0	63.5×117.5		Paige (6)		23.2	3 x 5 in.	650				
Ensign (6)	38 4	4×51 in.	1650 (c)	Paige (6)	0.0	29.5	$3\frac{1}{2} \times 5\frac{1}{6}$ in.	1,350	Zebre (4)	7.9	55 × 105	375



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